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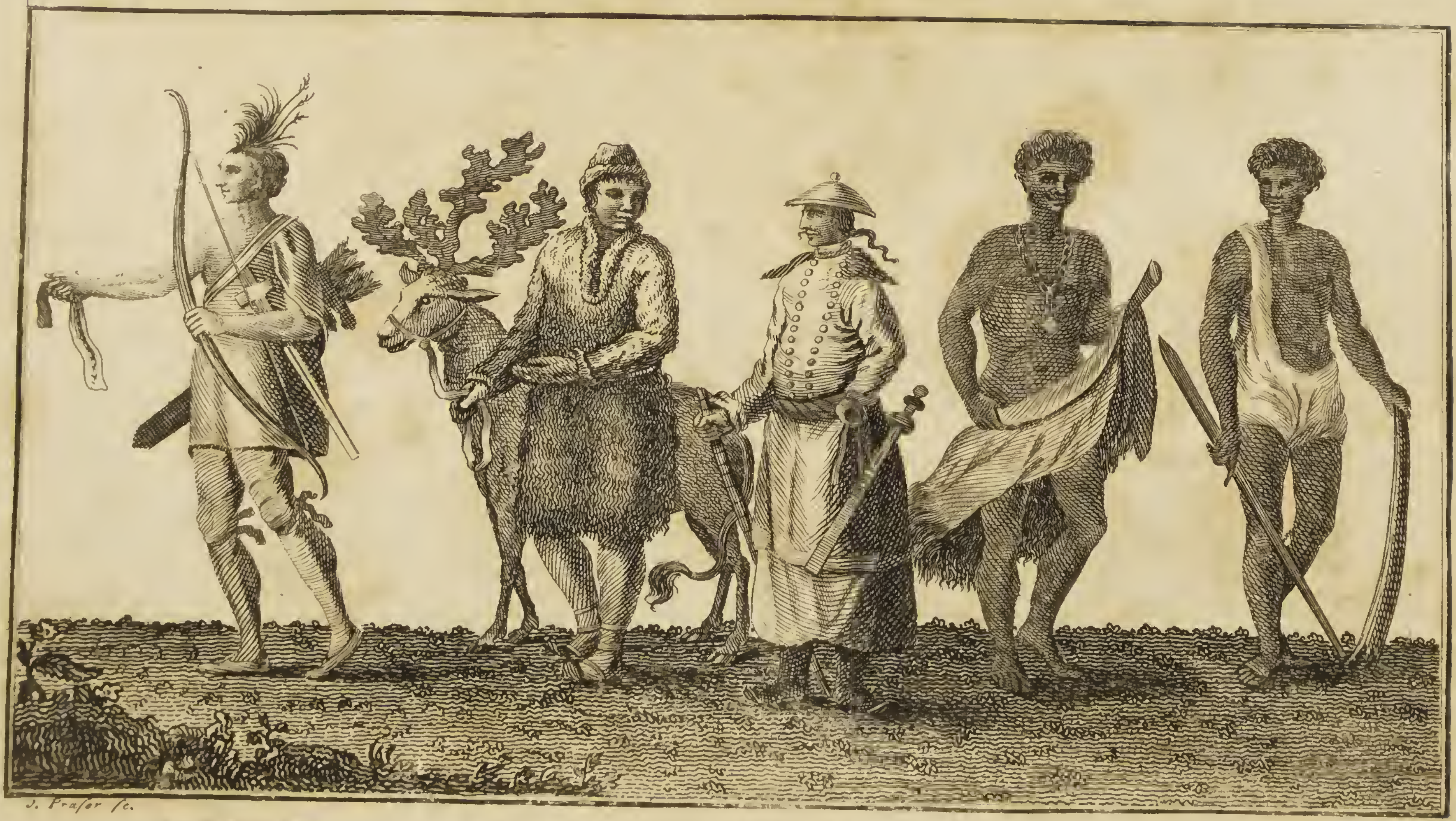

J. Fraſer ſc.

AMERICAN, LAPLANDER, CHINESE, HOTTENTOT, AFRICAN,

THE SYSTEM OF NATURAL HISTORY,

WRITTEN BY THE CELEBRATED

BUFFON,

CAREFULLY ABRIDGED;

WITH

ADDITIONAL EXTRACTS

FROM OTHER WRITERS.

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IN TWO VOLUMES.

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PREFACE.

NATURAL Hiſtory, is of all ſciences the moſt important, and extenſive. Its object is, to obſerve and claſſify the various appearances of nature, as they preſent themſelves ſpontaneouſly, while undiſturbed by the intervention of human art. The general phænomena of the univerſe, the wonders of the heavens, the form and ſtructure of the earth, animals, vegetables, foſſils, and inanimate bodies of all ſpecies, fall, therefore, under its obſervation. Whatever can be diſcovered of any of theſe, by an attentive ſurvey, or by carefully watching thoſe changes to which they are naturally ſubject, is recorded by the naturaliſt, in order that it may be added to the materials of ſome other ſcience or ſome art, or that it enlarge the general experience of mankind. No ſooner have we entered this world, than we begin to obſerve the appearances of nature: we attend to them in infancy with eager curioſity: a conſiderable acquaintance with them is neceſſary to fit us for the buſineſs of life, when we advance to manhood; the operator in every art, and the votary of whatever ſcience muſt ſearch in one department or another of Natural Hiſtory, for the materials of which every ſyſtem of ſcience is conſtructed, and the facts, by induction from which, the rules of every art are formed.

Although thus important, thus extenſive, and thus generally intereſting, it was late in the progreſs of knowledge, before natural hiſtory aſſumed a regular form, or began to be cultivated as a diſtinct branch of ſcience. Many theories of the earth and heavens had been imagined; the ſcience of ethics had been ſucceſsfully cultivated in all its different branches; the moſt important theorems in mathematics had been demonſtrated, and the moſt intricate problems ſolved; when Ariſtotle, the father of natural hiſtory, firſt attempted to collect a body of facts belonging to this department of knwledge, and to arrange them in ſcientific order. Taſte and genius had paſſed their meridian at Rome, when the elder Pliny collected that medley of precious ſcience and idle fancies, of fact and fable, which is the only valuable work upon natural hiſtory that the remains of Roman literature afford. And, in modern times, the heroes of almoſt every other ſcience had paſſed, before Buffon and Linnæus appeared.

But, if natural hiſtory did not, till a late period begin to aſſume a regular form, or to command the attention of the votaries of knowledge; it has at length become a favourite ſtudy with almoſt all claſſes of men. The philoſopher finds no taſk more pleaſing or more dignified, than to watch and compare the habits and manners of plants and animals. The virtuoſo rejoices in the poſſeſſion of a ſhell, a ſkeleton, or a ſtuffed ſkin, no leſs than in a ruſty medal, a faded picture, or a mutilated ſtatue. The painter, and the engraver have exhibited ſome of the fineſt ſpecimens of their reſpective arts in imitating the forms and colours of birds and quadrupeds. And what a numerous train of writers have lately ſought fame or emolument by illuſtrating ſubjects of natural hiſtory.

Linnæus and Buffon, the chief of theſe laſt, have equally diſplayed in their works, ſome of the higheſt efforts of genius; although differing as much in their views, and manner of compoſition, as is poſſible for two able writers, upon the ſame train of ſubjects. The one has reduced natural hiſtory to the auſtere regularity of ſcientific method; while the other has diſplayed its materials in a looſe order, and arrayed them in all the pomp of popular eloquence. The one has formed a new claſſification, and invented a new ſyſtem of technical language, as apparatus for his favourite ſcience: the other, in compliance with the taſte of his country, and the turn of his own genius, has endeavoured to ſtrip natural hiſtory of whatever is remote from popular expreſſion and popular ideas, and to teach her thoſe blandiſhments which invite and inſinuate, and attract the notice, and even the regard even of the gay, the careleſs, and the indolent. Buffon, like Deſcartes, Helvetius, Rouſſeau, and moſt of the other eminent philoſophers of France, intermixes ill-founded, and fantaſtic theory, in a large proportion, with extenſive and enlightened views of nature, and the moſt beautiful delineations of facts. Linnæus ſeems to have propoſed to himſelf to form ſimply an index to thoſe parts of the volume of creation which are open to human view. Both are eminently eloquent; but the eloquence of Buffon is copious, diffuſive, and often declamatory, and redundant: while Linnæus is remarkably conciſe and energetic. Yet, whatever may be their comparative merits, Buffon will long continue one of the moſt popular writers on ſcientific ſubjects: but, it is not probable, that the volumes of Linnæus, whether in the crude, German Latin, in which they were originally written, or tranſlated into any of the vernacular languages of Europe, will ever be fondly peruſed by any but men of ſcience.

Theſe views of the importance and extent of natural hiſtory, of the ardour with which it is, at preſent cultivated, and of the character of the moſt popular of the capital writers upon the ſcience, firſt ſuggeſted the idea of the PRESENT ABRIDGEMENT. It ſeemed probable, that the work of M. de Buffon might become ſtill more popular, and by conſequence, more generally uſeful, if it could be reduced to a leſs bulky and leſs expenſive form. It was natural to obſerve, that of thoſe who are deſirous of acquiring ſome knowledge of natural hiſtory, or of amuſing themſelves with the contemplation of the objects which it preſents, many are unwilling to be detained by theory, however plauſible, to liſten to amplifying declamation, or to perplex themſelves with examining authorities, or balancing the evidence on the different ſides of diſputed facts. To the young it is peculiarly proper to recommend the ſtudy of natural hiſtory; and nothing but a detail of intereſting facts, in eaſy, correct, and perſpicuous language can be put, with any proſpect of utility, into their hands.

The compiler of this Abridgement has been guided by theſe conſiderations in the performance of his taſk. He has rejected, as far as was practicable, without deſtroying the contexture of the work, all ſuch of M. de Buffon's theories as appeared to him, plainly ill-founded and fanciful: he has left out that diſplay of authorities, which M. de Buffon had not always confined to his notes, but frequently introduced into the text; and he has often condenſed his author's diffuſe deſcriptions of the forms and manners of animals, and abbreviated his narrative of hiſtorical facts relative to them. He has at the ſame time anxiouſly endeavoured to make this abridgement, a regular work having conſiſtency and connexion through all its parts, not an awkward heap of incoherent fragments. He hopes, that his language will not be found to be much more incorrect than that of either of the Engliſh tranſlations of M. de Buffon's work. In the latter part ſome additions are introduced from other writers.

If this publication ſhall contribute, in any degree, to render the knowledge of natural hiſtory more eaſily attainable, and to extend the reputation of M. de Buffon, the wiſhes of the Abridger and the Publiſhers will be fully gratified.

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OMITTING the theories of other writers with regard to the earth, we ſhall take notice of ſuch facts as have been univerſally acknowledged, together with thoſe additional ones which have come within the ſphere of our own obſervation.

The ſurface of this globe preſents us with heights, depths, plains, ſeas, marſhes, rivers, caverns, gulfs, volcanoes, in the diſpoſition of which, upon a ſlight view we obſerve neither regularity nor order. If we penetrate into the bowels of the earth, we diſcover metals, minerals, ſtones, bitumens, and, in ſhort, matter of every kind as it were without any apparent deſign. Upon a more accurate inſpection we perceive matter in every form, blended in a chaos of confuſion, which can be compared to nothing but the ruins of a world.

Amid theſe ruins, however, the different generations of animals, and of vegetables ſucceed each other in a beautiful and regular order. With reſpect to us, the earth, formerly a chaos, is now become a delightful habitation, where every object affords amazing diſplays of the power, of the intelligence and of the beneficence of its great Creator.

In examining and deſcribing the ſurface of the earth, the firſt object which ſolicits our attention, is that body of water with which the greater part of the globe is covered. The waters occupy the lower grounds, and, notwithſtanding their uniform tendency to reſt, they are kept in continual agitation by an agent, that communicates to them a regular periodic motion which produces a vibration, even to the moſt profound depths, in the whole maſs.

When we explore the bottom of the ſea, we diſcover hills and valleys, plains and hollows, and rocks and earths of every ſort. We diſcover too that iſlands are only the ſummits of vaſt mountains; we likewiſe find other mountains whoſe tops almoſt reach the ſurface of the water; and rapid currents which counteract the general movement; and of which the motion is ſometimes in the ſame direction, and at other times retrograde. On the one hand, we meet with tempeſtuous regions, where the heavens and the ocean ſeem equally confounded in the general ſhock; violent inteſtine emotions, tumultuous ſwellings, water-ſpouts, and ſtrange convulſions produced by volcanoes; and dreadful whirl-pools. On the other hand, we diſcover vaſt regions always calm, but equally dangerous to the mariner. In ſhort when we direct our eyes towards the polar regions, we perceive huge maſſes of ice, which having detached themſelves from them, advance, like floating mountains until they diſſolve in the temperate climates.

Beſides theſe grand objects, the ocean exhibits an infinite variety of animated beings; all of which find abundance of food in this fluid element.

But when we take a view of the land: what differences take place in different climates! what a variety of ſoils! what inequalities in the ſurface! Yet upon an attentive obſervation, we obſerve that the great chains of mountains lie nearer the equator than the poles; that, in the old Continent, their direction is more from eaſt to weſt than from north to ſouth. And the figure and direction of theſe mountains which appear moſt irregular, correſpond, ſo that the prominent angles of one mountain are conſtantly oppoſite to the concave angles of the neighbouring mountain, and of equal dimenſions, whether they be ſeparated by an extenſive plain or a ſmall valley. I have alſo remarked that the oppoſite are almoſt always of the ſame height; and that mountains for the moſt part occupy the middle of continents, iſlands and promontories, and that they divide them by their greateſt lengths. By tracing the courſes of the principal rivers too, I find that their direction is nearly perpendicular to the ſea-coaſts into which they empty themſelves, and that for the greater part of their courſes they follow the direction of the mountains from which they take their riſe. The ſea-coaſts are generally bordered with earth and ſand accumulated by the waters of the ſea, or ſwept down by rivers. In oppoſite coaſts, ſeparated only by ſmall arms of the ſea, the different ſtrata are of the ſame materials. Volcanoes never exiſt but in high mountains; a great number of them are entirely extinguiſhed; ſome are connected with others by ſubterraneous paſſages, and their eruptions pretty frequently happen at the ſame time. Similar communications ſubſiſt between certain lakes and ſeas. Some rivers diſappear on a ſudden and ſeem to precipitate themſelves into the bowels of the earth. Certain inland ſeas too conſtantly receive from many rivers prodigious quantities of water, and which as their bounds are not augmented, probably diſcharge thoſe extraneous ſupplies by ſubterraneous paſſages. Countries that have been long inhabited may likewiſe be eaſily diſtinguiſhed from thoſe where the earth appears in a rude ſtate, where the rivers are full of cataracts, where the land is either almoſt overflowed with water, or ſcorched with drought, and where every place where a tree can grow is covered with wood.

In our examination of the upper ſtratum of the earth, we find it to be univerſally the ſame ſubſtance, which ſubſtance is nothing elſe than a compoſition of the decayed parts of animal and vegetable bodies. Penetrating a little deeper, we diſcover the real earth, beds of ſand, lime-ſtone, clay, ſhells, marble, gravel, chalk, &c. Theſe ſtrata are always parallel to one another, and of the ſame thickneſs throughout. In neighbouring hills, ſtrata of the ſame materials are uniformly divided by perpendicular fiſſures. Shells, ſkeletons of fiſhes, marine plants, &c. perfectly ſimilar to thoſe of the ocean, are often found in the bowels of the earth, and on the tops of mountains at very great diſtances from the ſea. Petrified ſhells are found almoſt every where in prodigious quantities, not only incloſed in rocks of marble and lime-ſtone, in earths and in clays, but incorporated and filled with the very ſubſtances in which they are incloſed. Indeed all marbles, lime-ſtones, chalks, marles, clays, ſand, and almoſt all terreſtrial ſubſtances, are full of ſhells and other ſpoils of the ocean.

From theſe facts, let us try what concluſions can be drawn.

The changes which the earth has undergone for the laſt two or three thouſand years, are inconſiderable, when compared with thoſe revolutions which ſucceed the creation. For as the ſurface of the earth was at firſt much ſofter than it is now, of conſequence the ſame cauſes which at preſent produce but ſlight alterations for many centuries, were then capable of producing very great revolutions in a few years. It is very evident, in my opinion, that the dry land, and even the ſummits of the higheſt mountains, were formerly covered with the waters of the ſea; becauſe ſhells and other marine animals are ſtill found upon the very tops of mountains. It appears too that the waters of the ſea have remained a great number of years upon the ſurface of the earth; for ſuch immenſe banks of ſhells have been diſcovered, as to render it impoſſible for ſo great a number of animals to have exiſted at the ſame time. This circumſtance proves pretty clearly, that, though the materials on the ſurface of the earth were then eaſily diſunited by the water; yet theſe tranſportations could not be ſuddenly effected. Even though it ſhould be ſuppoſed, that, at the deluge, all the ſhells were tranſported from the bottom of the ocean and depoſited upon the dry land; yet, beſides the difficulty of eſtabliſhing this hypotheſis, it is evident, that as ſhells are found incorporated in marble, and in the rocks of the higheſt mountains, we muſt likewiſe ſuppoſe that all theſe marbles and rocks were formed at the ſame time, and that too when the deluge took place; and that before this grand revolution, there were neither mountains, nor marbles, nor rock, nor clays, nor matter of any kind like that with which we are now acquainted.

But without dwelling any longer upon this particular, I ſhall confine myſelf to well authenticated facts. It is certain, that the waters of the ſea have, at one period or other, continued for a ſucceſſion of ages upon what we now know to be dry land; and that, of conſequence, the vaſt continents of Aſia, Europe, Africa, and America, were then the bottom of an immenſe ocean, replete with every thing which the preſent one produces. It is alſo certain that the different ſtrata of the earth are horizontal and parallel to one another; which ſituation is occaſioned by the operation of the waters. The horizontal poſition of water is almoſt univerſal: in plains the ſtrata are perfectly horizontal. And it is only in the mountains that they are inclined to a horizon; becauſe they have been originally formed by ſediments depoſited upon an inclined baſe. Now theſe ſtrata muſt have been formed gradually; for nothing is more frequent than ſtrata compoſed of heavy materials placed above light ones, which could not have been the caſe, if the whole had been blended and diſſolved by the deluge, and then precipitated.

Another circumſtance requires our attention. Nothing but the motion and ſediments of water could poſſibly produce the regular poſition of the various ſtrata of which the ſuperficial part of this earth is compoſed. And as both the higheſt mountains, and the loweſt vallies conſiſt of parallel ſtrata, this parallel and horizontal poſition of ſtrata muſt be the effect of an uniform and conſtant cauſe. And hence we conclude that the dry and habitual part of the earth has remained a long time under the waters of the ſea, and muſt therefore have undergone the ſame changes which are at preſent going on at the bottom of the ocean. By examining therefore what paſſes in the bottom of this ſea, we ſhall ſoon be able to draw ſome rational concluſions reſpecting the external figure and internal conſtitution of the earth.

The ocean, ſince the creation of the ſolar ſyſtem, has been ſubject to a regular flux and reflux. This motion which uniformly takes place twice in twenty four hours, is principally owing to the moon, and is greater in the equatorial regions than in other climates. The earth too performs a rapid motion on its axis, and conſequently has a centrifugal force, which is alſo the greateſt at the equator; which laſt circumſtance proves that the earth muſt be more elevated under the equator than at the poles. From the tides, therefore, and the motion of the earth combined, we may fairly conclude, that, though this globe had originally been a perfect ſphere, its diurnal motion, and the ebbing and flowing of the tides, muſt, in a ſucceſſion of time, have elevated the equatorial parts, by gradually carrying mud, ſhells, &c. from other climates, and depoſiting them at the equator. On this hypotheſis, the the greateſt inequalities on the earth's ſurface ought to be found and indeed are found near the equator. But farther, as the alternate motion of the tides has been regular ſince the exiſtence of the world, may we not naturally imagine that, at each tide the water carries from one place to another a ſmall quantity of matter, which falls to the bottom as a ſediment, and forms thoſe horizontal and parallel ſtrata that every where appear.

It may, however, be objected that as the flux is equal to, and regularly ſucceeded by the reflux, the two motions will balance one another, and, of conſequence, that this cauſe of the formation of ſtrata muſt be chimerical, as the bottom of the ocean can never be affected by a uniform alternate motion of the waters.

But, in the firſt place, the alternate motion of the waters is far from being equal, as the ſea has a continual motion from eaſt to weſt, and alſo as the agitations occaſioned by the winds, produce great inequalities in the tides. By every motion of the ſea too, particles of earth and other materials, muſt be carried from one place and depoſited in another; and theſe collections of matter muſt aſſume the form of parallel and horizontal ſtrata. Beſides on all coaſts where the ebbing and flowing are diſcernible, numberleſs materials are brought in by the flux, which are not carried back by the reflux. Thus the ſea gradually increaſes on ſome places, and recedes from others. But in order to remove every doubt, let us examine more cloſely the practicability of a mountain being formed at the bottom of the ſea, by the motion and ſediments of the water. On a coaſt which the ſea laſhes with violence, ſome part of the earth muſt be carried off by every ſtroke of the waves. Even where the ſea is bounded by rock, it is a well authenticated fact, that ſmall particles are carried off from the rock by the retreat of every wave. Thoſe particles of earth or ſtone being tranſported to ſome diſtance; it happens that, when the agitation of the water is abated, the particles are precipitated in the form of a ſediment, and lay the foundation of a firſt ſtratum which will ſoon be ſucceeded by a ſimilar one. In proceſs of time this gradually accumulating maſs will become a mountain in the bottom of the ſea, perfectly like, both in external and internal ſtructure the mountains on the dry land. When the bottom of the ſea too, at particular places, is troubled by the agitation of the water, earth, clay, ſhells, and other matter, muſt be removed from thence, and depoſited elſewhere. For divers aſſure us, that the bottom of the ſea, at the greateſt depths to which they deſcend, is ſo ſtrongly agitated by the water, that earth, clay and ſhells are removed to great diſtances. Tranſportations of this kind muſt therefore go on in every part of the ocean; and the matters tranſported, after having ſubſided, muſt raiſe eminences ſimilar to the compoſition and ſtructure of our mountains. We muſt not however imagine that theſe matters cannot be carried to a great diſtance; for we daily find grain, and other productions of the Eaſt and Weſt Indies landing on our coaſts. Theſe bodies may be ſaid to be ſpecifically lighter than the water, and the other ſubſtances ſpecifically heavier. Yet as they are reduced to an impalpable powder, they may be long ſuſpended in the water, and conſequently tranſported to any diſtance.

It has been imagined that the agitation, produced by the winds and tides, does not affect the bottom when it is very deep. But the truth is, that whatever be the depth, the power which occaſions the flux and reflux operates equally upon every particle of the maſs at the ſame time. It therefore appears that the tides, the winds, and whatever elſe gives birth to motion in the ſea, muſt produce heights and inequalities in its bottom; and that theſe eminences muſt uniformly be compoſed of regular ſtrata, either horizontal or inclined.

Whenever eminences are formed, they interrupt the uniform motion of the waters, and produce new ones called currents. Between two neighbouring heights in the bottom of the ocean, there muſt be a current, which will follow their common direction, and, like a river cut a channel, the angles of which will be alternately oppoſite through the whole of its courſe. Theſe heights muſt continually increaſe, as the water will depoſite its ordinary ſediment upon their ridges; and thus by means of the different motions and ſediments, the bottom of the ocean, though formerly ſmooth, muſt ſoon be furrowed, and interſperſed with hills and chains of vaſt mountains, as we find it at preſent. And the materials which conſiſted of ſandy and cryſtalline particles, would produce thoſe maſſes of rock and flint in which we find cryſtals and other precious ſtones. Others compoſed of ſtony particles and ſhells, produce lime ſtone and marble; and laſtly particles of ſhells mixed with a pure earth, have given riſe to all our beds of marle and chalk.

It may be ſaid however that the greater number of hills, whoſe ſummits conſiſt of ſolid rocks of moor ſtone, or marble, are founded upon ſmall eminences compoſed of lighter materials. But the explication of this phœnomenon is perfectly eaſy. The waters would firſt operate upon the upper ſtratum, either of coaſts, or the bottom of the ſea. This upper ſtratum generally conſiſts of clay or ſand; and theſe light ſubſtances being carried off and depoſited ſooner than the more denſe and ſolid, they would of conſequence become foundations for the more heavy particles to reſt upon. The harder and more ponderous ſubſtances would next be ſubjected to the attrition of the water, and carried off and depoſited about the hillocks of ſand or clay. Theſe ſmall ſtony particles would, in proceſs of time, form thoſe ſolid rocks which we now find on the tops of hills and mountains. And as particles of ſtone are heavier than thoſe of either ſand or clay, it is probable that they were originally covered by ſuperior ſtrata of conſiderable depth; but that they now occupy the higheſt ſtations, becauſe they were laſt tranſported by the waves.

To confirm this reaſoning, it is worthy of remark, that, the different ſtrata of ſtones in quarries are almoſt all horizontal or regularly inclined. Indeed the ſtrata of granite, vitrifiable ſand, clays, marbles calcareous ſtones, chalk, and marles, are always parallel or equally inclined. And, the diſpoſition of ſtrata, as deep as mankind have penetrated is the ſame.

Thoſe beds of ſand and gravel which are waſhed down from the mountains, muſt, in ſome degree be excepted from the general rule. And as they are formed by rivers and brooks which often change their channels, it is not ſurprizing that they are ſo frequent. The ſtrata formed by rivers are not very ancient; they are eaſily diſtinguiſhed by their frequent interruptions, and the inequality in thickneſs, which is conſtantly varying, but the ancient ſtrata uniformly preſerve the ſame dimenſions throughout. Theſe modern ſtrata may likewiſe be diſtinguiſhed by the form of the ſtones and gravel they contain, which bear evident marks of having been rounded by the motion of water. The ſame obſervation holds good with reſpect to thoſe beds of turf, and corrupted vegetables, which are found in marſhy grounds, immediately below the ſoil; and which have derived their origin from ſucceſſive accumulations of decayed trees, and other plants. The ſtrata of ſlime and mud being formed by ſtagnating waters, or the inundations of rivers, are neither ſo perfectly horizontal, nor ſo uniformly inclined, as thoſe produced by the regular motions of the ſea. In ſtrata formed by rivers, we meet with river and ſeldom with ſea ſhells; but in the ancient ſtrata there are no river ſhells; the ſea ſhells are numerous, well preſerved and all placed in the ſame manner. From whence could this beautiful regularity proceed? Inſtead of regular ſtrata, why do we not find the materials which compoſe the earth huddled together without order? Why are not rocks, marbles, clays, marles, &c. ſcattered promiſcuouſly, or joined by irregular or vertical ſtrata? Why are not heavy bodies found in a lower ſituation than light ones? It is eaſy to perceive, that this uniformity of nature, this ſpecies of organization, this union of different materials by parallel ſtrata, without regard to their weights could only proceed from a cauſe equally powerful and uniform as the motions of the ſea, produced by regular winds, or by the flux and reflux, &c.

As theſe cauſes act with ſuperior force under the equator than in other climates, the chains of mountains are moſt extenſive in its neighbourhood. Thus the mountains of Africa and Peru are both the higheſt and moſt extenſive in the world. The mountains of Europe and Aſia, which extend from Spain to China, are not ſo high as thoſe of Africa and South America. Beſides, in the northern ſeas, the iſlands are but few, when compared with thoſe in the Torrid Zone. As iſlands, therefore, are nothing but the ſummits of mountains, it is clear that there are more inequalities on the ſurface of the earth, near the equator than in northerly climates.

Thoſe vaſt chains of mountains which run from weſt to eaſt in the old continent, and from north to ſouth in the new, muſt have been formed by the general motion of the tides. But the origin of the ſmaller mountains and hills may be aſcribed to particular motions occaſioned by winds, currents, and other irregular agitations of the ſea, or to a combination of all thoſe motions, which are capable of infinite variations.

But how has it happened, that this earth, which, from time immemorial, has been an immenſe continent, ſhould, if formerly the bottom of an ocean, be now ſo much elevated above the waters, and ſo compleatly ſeparated from them?

A little reflection will furniſh us with at leaſt, plauſible ſolutions. We daily obſerve the ſea gaining ground on certain coaſts, and loſing it on others. The ocean has a general and uniform motion from eaſt to weſt; there are whole provinces which human induſtry can hardly defend from the fury of the waves, and there are iſlands which have but lately emerged from the waters, and regular inundations. Hiſtory too informs us of inundations and deluges of a more extenſive nature. Should not all this convince us, that the ſurface of the earth has undergone very great revolutions, and that the ſea may have given up the greater part of the ground which ſhe formerly poſſeſſed? Let us ſuppoſe for example, that the old and new worlds were formerly but one continent, and that, by a violent earthquake, the ancient Atalantis of Plato was ſunk. What would be the conſequence? The ſea would ruſh in from all quarters, and from what is now called the Atlantic Ocean, and vaſt continents would of conſequence be left dry. This great revolution might be effected by the ſudden failure of ſome immenſe cavern in the interior part of the globe, and an univerſal deluge would infallibly ſuceeed. I am inclined however to think, that to effect ſuch a revolution would require a very long period. Be theſe conjectures as they may, it is certain that the revolution has happened, and I believe it has happened naturally. It is a well authenticated fact that the ocean has a conſtant motion from eaſt to weſt; which motion like the trade-winds, is not only perceived between the tropics, but through the whole temperate climates, and as near the poles as navigators have approached. In conſequence of this motion, the Pacific Ocean muſt make continual efforts againſt the coaſts of Tartary, China and India; the Indian Ocean muſt act againſt the eaſt coaſt of Africa; and the Atlantic muſt operate in a ſimilar manner upon the eaſtren coaſts of America. Hence the ſea has gained, and will always gain on the eaſt and loſe on the weſt. If ſuch is the natural effect of the motion of the ſea from eaſt to weſt, may we not ſuppoſe that Aſia, and all the eaſtern continent is the moſt ancient country in the world? and that Europe and part of Africa, particularly the weſt parts of theſe continents, as Britain, France, Spain, &c. are more recent countries? Both hiſtory and phyſics, concur to eſtabliſh this hypotheſis.

But there are many lands lower than the level of the ſea, and defended only by banks, which the action of the waters muſt gradually deſtroy, and of conſequence the lands muſt then become part of the ocean. The mountains too are daily diminiſhing; and every little brook carries earth, and other materials from the high grounds into the rivers, by which they are at leaſt tranſported to the ocean. Thus the bottom of the ſea is gradually filling up, and the ſurface of the earth is approaching to a level.

But we ſhall give a detail of facts in order to explain the different alterations which the earth has undergone, whether by irruptions of the ſea upon the land, or by the ſea returning from lands which it formerly occupied.

That irruption which gave birth to the Mediterranean is no doubt the greateſt. The motion through the ſtraits of Gibraltar is contrary to the motion in every other ſtrait; for the general motion of the ſea is from eaſt to weſt; but in the ſtraits of Gibraltar it is from weſt to eaſt. This circumſtance is a clear proof that the Mediterranean Sea is not an ancient gulf, but that it has been formed by an irruption, produced by ſome accidental cauſe.

When the ocean forced this paſſage, it ran through the ſtraits with much more rapidity than it does now, and immediately deluged that large tract of land which formerly joined Europe with Africa. The waters covered all the grounds which were lower than the level of the ocean; and no part of them is to be ſeen at preſent, except the tops of ſome of the mountains, ſuch as part of Italy, Sicily, Malta, Corſica, Sardinia, Cyprus, Rhodes, and the iſlands of the Archipelago.

It is not improbable, that the Black Sea will, ſome time or other, be entirely divided from the Mediterranean; and that the Boſphorus will be choaked up, whenever the rivers ſhall have accumulated a quantity of materials ſufficient for that purpoſe.

The Caſpian and Black Seas ſhould rather be conſidered as lakes than as gulfs of the ocean; becauſe they are perfectly ſimilar to other lakes that receive a number of rivers without any viſible outlet, as the Dead Sea, ſeveral lakes in Africa and elſewhere.

But that we may give ſome recent examples of the changes of ſea into land and of land into ſea. At Venice the bottom of the ſea is conſtantly riſing. And the ſame thing may be ſaid, of moſt harbours, bays, and mouths of rivers. In Holland the bottom of the ſea is elevated in many places, the gulf of Zudovzee and the ſtraits of the Texel, cannot receive ſuch large veſſels as formerly; and it is quite evident that the ſea is always damned up, wherever great rivers empty themſelves. The Rhine is loſt in the ſands which itſelf has accumulated. The Danube, the Nile, and all large rivers, after they have tranſported great quantities of ſlime, ſand, &c. never arrive at the ſea by a ſingle channel. Marſhes are drained every day; lands, forſaken by the ſea, are now plowed and ſown; we navigate whole countries now covered by the waters. In ſhort, we ſee ſo many inſtances of land changed into water, and water into land, as to convince us that, in time, the gulfs of the ocean will become continents; the iſthmuſes will be changed into ſtraits; and the tops of the mountains converted into ſhoaly rocks in the ſea.

Still, however, thoſe perpendicular fiſſures, which are equally diffuſed through rocks, clays, and every conſtituent material of the globe, remain to be conſidered. The perpendicular fiſſures are indeed placed at greater diſtances from one another, than the horizontal; and the ſofter the matter, the more diſtant are the fiſſures. In marble and hard ſtone, the fiſſures are only a few feet aſunder. If the maſs of rock be extenſive, the diſtance between the fiſſures is ſome fathoms.

The cauſe of perpendicular fiſſures is eaſily inveſtigated. As various materials conſtituting the different ſtrata were tranſported by the waters, and depoſited in the form of ſediments, they would at firſt be in a very diluted ſtate, and would by degrees harden and part with the ſuperfluous quantity of water they contained. In the proceſs of drying, they would contract and ſplit at irregular diſtances. The contraction, therefore, of the parts in drying is the cauſe of perpendicular fiſſures; for I have often remarked, that the ſides of thoſe fiſſures, through their whole extent, correſpond as exactly as the two ſides of a ſplit piece of wood.

Perpendicular fiſſures vary greatly as to the extent of their openings. It is clear, however, that the fiſſures, whoſe openings are ſmall, have been occaſioned ſolely by drying. But thoſe which extend ſeveral feet are partly owing to the ſinking of the foundation upon one ſide while that of the other remains firm. When rocks are founded on clay or ſand, they ſometimes ſlip a little to a ſide; and the fiſſures are of conſequence increaſed by this motion. I have not taken notice of thoſe prodigious cuts which are found in rocks and mountains, and which could be produced by nothing but the ſinking of immenſe ſubterraneous caverns that were unable to ſupport the load any longer. But theſe cuts in mountains are not of the ſame nature with perpendicular fiſſures: They appear to have been ports opened by the hand of nature for the communication of nations. This appears to be the intention of all large openings in chains of mountains, and of thoſe ſtraits by which different parts of the ocean are connected; as the ſtraits of Thermopyle, of Gibraltar, &c., the gaps or ports in Mount Caucaſus, the Cordeliers, &c.

Theſe great ſinkings, though owing to accidental and ſecondary cauſes, are leading facts in the hiſtory of the earth, and have contributed much to change the appearance of its ſurface. Moſt of them have been produced by ſubterraneous fires, whoſe exploſions give birth to earth-quakes and volcanoes. But though the force of inflamed matter pent up in the bowels of the earth be great, and though its effects appear to be prodigious, we cannot ſuppoſe that theſe ſubterraneous fires are only branches of an immenſe abyſs of flame in the center of the earth: nor do we believe that thoſe fires have their ſeat at a great depth below the ſurface, as matter cannot begin to burn, or at leaſt the inflammation cannot be ſupported without air. In order to be convinced that the matter emitted by volcanoes does not come from any conſiderable depth, we have only to attend to the height of the mountain, and to conſider the amazing force which would be neceſſary to project ſtones and minerals to the height of half a league; for Ætna, Hecla, and other volcanoes have at leaſt that elevation.

This, however, is not inconſiſtent with volcanoes being the cauſe of conſiderable earthquakes; nor does it contradict the communication of one volcano with another, by means of ſubterraneous paſſages. For to produce an earthquake in a plain, it is not neceſſary that the bottom of the volcano ſhould be below the level of that plain, nor that there ſhould be ſubterraneous cavities filled with the ſame burning matter under it. A violent exploſion may by its reaction produce an earthquake of conſiderable extent. I would not, however, be thought to ſay that no earthquakes derive their exiſtence from ſubterranean fires; all I mean is that there are earthquakes produced ſolely by the exploſion of volcanoes.

It is not difficult to account for volcanoes appearing only in mountains; for greater quantities of minerals, ſulphur, and pyrites exiſt in mountains and nearer the ſurface than in the plains. Beſides mountains are more ſubject to the impreſſions of the air, and receive more rain and moiſture, by which mineral ſubſtances are capable of being fermented to ſuch a degree as to produce actual inflammation. And mountains having diminiſhed, nearly in proportion to the quantity of matter thrown out is another proof that the volcanoes are not ſo deep as the baſe of the mountains, and even that they are not much below the ſummit.

In ſeveral places, earthquakes have formed conſiderable hollows, and even ſome large gaps in mountains. All other inequalities are coeval with the mountains themſelves, and owe their exiſtence to currents in the ocean.

From what has been ſaid, it is eaſy to perceive how much ſubterraneous fires have contributed to change both the ſurface and internal part of the globe. But it is difficult to conceive how any ſenſible alteration upon the land can be produced by the winds. Their dominion would appear to be confined to the ſea; yet it is well known that the winds raiſe mountains of ſand in Arabia and Africa; and that they frequently carry theſe ſands many leagues into the ſea, where they form banks, downs, and even iſlands. Every body knows that hurricanes are the ſcourge of the Antilles, of Madagaſcar, and of other countries, and that their impetuoſity is ſo violent as to drive back rivers, to overthrow rocks and mountains, to ſcoup out holes and gulphs in the earth, and totally to change the face of thoſe unhappy countries which they infeſt.

But the greateſt changes upon the ſurface of the earth are produced by rains, rivers, and torrents from the mountains. Theſe derive their origin from vapours raiſed by the ſun from the ſurface of the ocean, and which are tranſported by the winds through every climate. The progreſs of theſe vapours is interrupted by the tops of the mountains, where they accumulate into clouds, and deſcend in the form of rain, dew, or ſnow. By their intrinſic gravity, they ran to the bottom of the mountains, and penetrating or diſſolving the lower grounds, they ſwept along with them ſand and gravel, furrowed the plains, and thus opened paſſages to the ſea, which always gains as much water by rivers, as it loſes by evaporation. The windings in the channels of rivers uniformly have correſponding angles on their oppoſite banks; and, as mountains and hills, which may be conſidered as the banks of the vallies by which they are ſeparated, have alſo ſinuoſities with correſponding angles, this circumſtance ſeems to demonſtrate, that the vallies have gradually been formed by currents of the ocean, in the ſame manner as the channels of rivers have been produced.

The waters which run upon the ſurface, compoſe perhaps not one half of the quantity that is produced by vapour. In almoſt all the vallies and low grounds, at a certain depth, water is uniformly to be found; but, in high grounds, it is impoſſible to extract water from the bowels of the earth. There are extenſive countries, where no wells can be obtained. In the eaſt, and eſpecially in Arabia, Egypt, and Perſia, wells and ſprings are ſeldom to be met with. To ſupply their place, the inhabitants have been obliged to make large reſervoirs to collect the rain water. In plain countries, furniſhed with large rivers, it is almoſt impoſſible to break the ſurface of the earth without finding water.

The greateſt part of the water ſo liberally diffuſed through low grounds, comes from the neighbouring hills and eminences. During great rains, or the ſudden melting of ſnow, part of the water runs upon the ſurface; but moſt of it penetrates the earth and rocks by ſmall chinks and fiſſures. It emerges indeed as ſoon as it can find an opening; but it often creeps along until it can find a bottom of clay, or hard earth, and there forms ſubterraneous lakes, brooks, and perhaps rivers, whoſe channels are conſigned to eternal oblivion.

There are ſeveral lakes which neither receive nor give origin to any river. A greater number, however, receive no conſiderable river, but are the ſources of the largeſt in the world. Such are the lakes from which the river St Laurence ariſes; the lake Chiame, from which two large rivers proceed, that water the kingdoms of Aſem, and Pegu; the lakes of Aſſiniboil in America; thoſe of Ozera in Muſcovy; thoſe too which give riſe to the Bog and the Irtis, and many more. It has been affirmed, indeed, that lakes are to be found on the tops of the higheſt mountains; but thoſe found on the Alps, and other elevated ſituations, all derive their origin from the waters which run down the ſides, or are filtered through the bowels of theſe ſuperior eminences.

Hence the exiſtence of ſubterraneous collections of water; for mountains, hills, and heights of every ſort, are expoſed on every ſide to the weather. The waters which fall upon any place of an elevated ſituation, muſt, after penetrating the earth, from the declivity of the ground, break forth at many places, ſprings and fountains: and of conſequence little water will be found in the bowels of mountains. But, in plains, as the water filtrated through the earth can find no vent, it muſt be collected in ſubterraneous caverns, or diſperſed in ſmall veins among ſand and gravel. The bottom of a pit or well is only a ſmall artificial baſon, into which the water inſinuates itſelf from the higher grounds. Hence it is, that, though water may be found in any part of a plain, only a number of wells can be ſupplied in proportion to the quantity of water diffuſed, or rather to the extent of the higher grounds from which it comes.

To find water, it is unneceſſary to dig below the level of the river. Even what is found in the earth below the level of the rivers, is not derived from them. Five or ſix feet of earth is ſufficient to contain water, and to prevent its eſcape.

It would not be eaſy to make an exact calculation of the quantity of ſubterraneous waters that have no apparent iſſue. Many ſuppoſe that it is far greater than all that is upon the ſurface of the earth. But it is probable that the quantity of ſubterraneous waters which never appear at the ſurface, is very inconſiderable; for, if the number of ſubterraneous rivers were ſo great, why do we never ſee any of their mouths break out like ſprings, on the ſurface. But rivers likewiſe produce conſiderable changes on the ſurface of the earth; they carry off the ſoil; they wear away the moſt ſolid rocks, and ſweep off whatever oppoſes them. The ſame effects would reſult from ſubterraneous rivers. But no ſuch changes have ever been diſcovered; the different ſtrata every where preſerve their parallel and primitive poſition.

From what we have advanced, we may conclude, that the flux and reflux of the ocean have produced all the mountains, valleys, and other inequalities on the ſurface of the earth; that currents of the ſea have ſcouped out the valleys, elevated the hills, and beſtowed on them their correſponding directions; that the waters of the ocean too, by tranſporting and depoſiting earth, &c. have given exiſtence to the parallel ſtrata; that the waters from the heavens deſtroy the effects of the ſea, by diminiſhing the height of the mountains, filling up the vallies, and choaking the mouths of the rivers; and, by reducing every thing to its former level, they will reſtore the earth to the ſea, which, by its natural operations, will again create new continents, beautifully diverſified with mountains and vallies, and in every reſpect like thoſe which we now inhabit.

The ſurface of this globe is divided, from one pole to the other, into two immenſe bands of earth, and two of water. The principal of theſe bands is that which is called the ancient continent, and which includes Europe, Aſia, and Africa. This continent, if meaſured from the two extreme points, that is, from the moſt eaſtern point of Tartary to the Cape of Good Hope, will produce a line of 3600 leagues; and if meaſured directly from north to ſouth, we ſhall find that there are only 2500 leagues from the northern Cape of Lapland to the ſouthernmoſt point of the Cape of Good Hope. The utmoſt breadth of this continent, that is, from the weſtern coaſt of Africa to Trefana, as far as Niſingpo, on the eaſt coaſt of China, is about 2800 leagues.

Another line may be drawn alſo from Breſt in Brittany, as far as the coaſt of Chineſe Tartary, which will be about 2300 leagues. The old continent, on the beſt calculations, may be ſaid to contain 4,940,780 ſquare leagues, which is about a fifth part of the ſurface of the globe, and may be conſidered as a large belt of earth, with an inclination to the equator of about 30 degrees.

The new continent, is called America, and is divided into north and ſouth. Its greateſt length may be eſtimated from the mouth of the river Plata in Paraguay to the lake of the Aſſeniboils, which amounts to about 2500 leagues. It is ſuppoſed to contain 2,140,212 ſquare leagues. The whole ſuperficial contents, therefore, of both the old and new continents are about 7,080,993 ſquare leagues, not near a third of the ſurface of the globe, which contains 25,000,000 ſquare leagues.

Of theſe lines, which divide both the continents into two equal parts, it is worthy of remark, that they both terminate at the ſame degrees of north and ſouth latitude; and that the two continents make mutual advances perfectly oppoſite to one another, to wit, thoſe on the African coaſt, from the Canary Iſles to Guiney; and thoſe of America, from Guiana to the mouth of the Rio-Janiero.

It, therefore, appears, that the moſt ancient lands on the globe, are thoſe which extend from 200 to 250 leagues on each ſide of the two lines that we have already taken notice of. Agreeable to which idea, we conclude, that, in the old continent, the moſt ancient countries of Africa are thoſe which reach from the Cape of Good Hope to the Red Sea and Egypt, and are about 500 leagues broad; and, of conſequence, that the whole weſtern coaſt of Africa, from Guiney to the Straits of Gibraltar, are new lands.

In the new continent we ſhall likewiſe find, that Terra Magellanica, the eaſtern part of Braſil, of the country of the Amazons, of Guiana, and of Canada, are new lands when compared with Tucuman, Peru, Terra Firma, the iſlands in the Gulf of Mexico, Florida, the Miſſiſippi, and Mexico.

It was but a ſmall part of the globe with which the ancients were acquainted. All America, the Arctic circle, Terra Auſtralis the Magellanic, and a great part of the internal regions of Africa, was entirely unknown to them. They knew not that the torrid zone was inhabited, although they had navigated around Africa; for it is 2200 years ſince Neco king of Egypt gave veſſels to the Phœnicians which departed from the Red Sea, coaſted round Africa, doubled the Cape of Good Hope, and having employed two years in this voyage, the third year they entered the ſtraits of Giblratar*. Nevertheleſs, the ancients were not acquainted with the property which the load-ſtone had, of turning towards the poles, although they knew that it attracted iron. They were ignorant of the general cauſe of the flux and reflux of the ſea; they were not certain the ocean ſurrounded the globe without interruption; ſome indeed ſuſpected it, but with ſo little foundation, that no one dared to ſay, or even conjecture it was poſſible to make a voyage round the world. Magellan was the firſt who made it A. D. 1519 in 1124 days. Sir Francis Drake was the ſecond in 1577, and he did it in 1056 days; afterwards Thomas Cavendiſh made this great voyage in 777 days, in the year 1586. Theſe famous voyagers were the firſt who demonſtrated phyſically, the globular form and the extent of the earth's circumference: for the ancients were far from having a juſt meaſure of this circumference, although they had travelled a great deal. The general and regulated winds, and the uſe to be made of them in long voyages, were alſo abſolutely unknown to them; therefore, we muſt not be ſurprized at the little progreſs they made in Geography, ſince at preſent, in ſpite of all the knowledge we have acquired by the aid of mathematical ſciences, and the diſcovery of navigators, many things remain ſtill to be found, and vaſt countries to be diſcovered.

As there is ſo large a portion of the globe with which we are unacquainted, particularly near the poles, where the ice has never permitted any navigator to penetrate, we cannot exactly know the proportion between the ſurface of the earth, and that of the ſea; only as much as may be judged by inſpection of what is known, there is more ſea than land.

If we would have an idea of the enormous quantity of water which the ſea contains, let us ſuppoſe one common and general depth to the ocean; by computing it only at 200 fathom, or the 10th part of a mile, we ſhall ſee that there is water ſufficient to cover the whole globe to the height of 600 feet of water, and if we would reduce this water into one maſs, we ſhall find that it forms a globe of more than 60 miles diameter.

The form of the earth is not that of a perfect globe, but rather what is termed a ſpheroid, a globe which is flattiſh at the poles, the axis, therefore, or line which may be ſuppoſed to paſs through it at the equator, is to its axis at the poles in the proportion of 230 to 229. The ſolid parts of the earth are formed of beds or ſtrata of different materials, which lie one upon another in a regular order. The firſt ſtratum conſiſts of common ſoil, mixed with a variety of decayed vegetable and animal ſubſtances, and with ſtony and ſandy particles. In different parts of the world the other ſtrata are found to conſiſt of different materials, and differently diſpoſed. In ſome parts the ſtrata are horizontal, in others they are inclined; and veins or fiſſures of metals, coals, and other minerals, frequently penetrate through the different beds or ſtrata to a great depth, and divide them. At Marly-la-Ville in France, which is a high country, but flat and fertile; the following ſtrata were found arranged horizontally. From the ſhells which were found in N° 16, we may conjecture, that at ſome period the ſoil of Marly-la-Ville was the bottom of the ſea, but has ſince been raiſed to the height of 75 feet.

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* See Herod. Lib. iv.

The ſtate of the various Beds of Earth found at Marly-la-Ville, at the depth of 100 feet.

	Feet	Inch.
I. A free reddiſh earth, mixed with much mud, a very ſmall quantity of vitrifiable ſand and ſomewhat more calcinable ſand	13	0
II. A free earth or ſoil mixed with more gravel, and a little more vitrifiable ſand - - - - - - -	2	6
III. Dirt mixed with vitrifiable ſand in a very great quantity, and which made but very little efferveſcence with aqua fortis	3	0
IV. Hard marle, which made a very great effervescence with aqua fortis. - - - - - - - -	2	0
V. Pretty hard marly ſtone - - - -	4	0
VI. Marle in powder, mixed with vitrifiable ſand -	5	0
VII. Very fine vitrifiable ſand - - -	1	6
VIII. Marle in earth, mixed with a little vitrifiable ſand	3	6
IX. Hard marle, in which was real flint - -	3	6
X. Gravel, or powdered marle - - -	1	0
XI. Eglantine, a ſtone of the grain and hardneſs of marble, and ſonorous - - - - - - - -	1	6
XII. Marly gravel - - - - - - -	1	6
XIII. Marble in hard ſtone, whoſe grain was very fine	1	6
XIV. Marle in ſtone, whoſe grain was not ſo fine -	1	6
XV. More grained and thicker marle - - -	2	6
XVI. Very fine vitrifiable ſand, mixed with ſea foſſile ſhells, which had no adherence with the ſand, and whoſe colours were perfect - - - - - - - -	1	6
XVII. Very ſmall gravel or fine marle powder -	2	0
XVII. Marle in hard ſtone - - - -	3	6
XIX. Very large powered marle - - - -	1	6
XX. Hard and calcinable ſtone like marble - -	1	6
XXI. Grey and vitrifiable ſand mixed with foſſile ſhells, particularly oyſters and muſcles, which have no adherence with ſand, and which are not petrified - - - - - -	3	0
XXII. White vitrifiable ſand mixed with ſhells - -	2	0
XXIII. Sand ſtreaked red and white, vitrifiable and mixed with the like ſhells - - - - - - - -	1	0
XXIV. Larger ſand, but ſtill vitrifiable, and mixed with the like ſhells - - - - - - - - - -	1	0
XXV. Grey, fine and vitrifiable ſand mixed with the like ſhells	8	6
XXVI. Very fine fat ſand, where there were only a few ſhells	3	0
XXVII. Free-ſtone - - - - - -	3	0
XXVIII. Vitrifiable ſand, ſtreaked read and white -	4	0
XXIX. White vitrifiable ſand - - - - -	3	6
XXX. Reddiſh vitrifiable ſand - - -	15	0
Total depths when they left off diging	101 ft.	

In

Within a trench made at Amſterdam, the earth was dry to the depth of 230 feet, and the ſtrata of earth were found as follows: 7 feet of vegetable or garden earth, 9 feet turf, 9 feet ſoft clay, 8 feet ſand, 4 feet earth, 10 feet ſand, on which it is cuſtomary to fix the piles which ſupport the houſes of Amſterdam; then 2 feet argile, 4 of white ſand, 5 of dry earth, 1 of ſoft earth, 14 of gravel, 8 argile, mixed with earth; 4 of gravel, mixed with ſhells; then clay 102 feet thick, and at laſt 31 feet ſand, at which depth they ceaſed digging.

Every ſtratum, whether horizontal or inclined, has an equal thickneſs through its whole extent: that is to ſay, every bed of any matter whatſoever, taken ſeparately, has an equal thickneſs through its whole extent; for example, when the bed of ſtone in a quarry is three feet thick in one part, it will have the ſame thickneſs throughout: if in one part it is found to be ſix feet thick, it will be ſo throughout. In the quarries about Paris the bed of good ſtone is not thick, and ſcarcely 18 or 20 feet thick; in other quarries, as thoſe of Burgundy, the ſtone is much thicker; it is the ſame with marble; the black and white marble have a thicker bed; the coloured are commonly thinner, and I know beds of very hard ſtone, which the farmers in Burgundy make uſe of to cover their houſes, that are not above an inch thick. The thickneſs of different beds, therefore, are different, but each bed preſerves the ſame thickneſs throughout its extent; in general it may be ſaid, that the thickneſs of the horizontal ſtrata is ſo greatly varied, that it is found from one line and leſs to 1, 10, 20, 30, or 100 feet thick; the ancient and modern quarries which are horizontally dug; the perpendicular and other diviſions of mountains, prove that there are extenſive ſtrata in every direction.

The various ſtrata of which the earth is compoſed, are not diſpoſed according to the order of their ſpecific weight; for we often find ſtrata of heavy matters placed on ſtrata of lighter. To be aſſured of this, we have only to examine the nature of the earth on which rocks are placed, and we ſhall find that it is generally clay which is ſpecifically lighter than the matter of the rock. In hills and other ſmall elevations, we eaſily diſcover the baſe on which rocks are placed; but it is not ſo with large mountains, not only the ſummit is rock, but thoſe rocks are placed on other rocks; there are mountains upon mountains and rocks upon rocks, to ſuch a conſiderable height, and in ſo great an extent of ground, that we can ſcarcely be certain where there is earth at bottom, and of what nature it is. We ſee picked rocks which are many hundred feet high; theſe rocks reſt on others, which perhaps are no leſs ſo; nevertheleſs, may we not compare great with ſmall? and ſince the rocks of little mountains, whoſe baſes are to be ſeen, reſt on earth leſs heavy and ſolid than ſtone, may we not ſuppoſe that the baſe of high mountains is alſo of earth?

In a ſoil where flint is the predominant ſtone, the country is generally fertile, and if the place is uncultivated, and theſe ſtones have been long expoſed to the air, without being moved, the upper ſuperficies is always very white, whilſt the oppoſite ſide, which touches the earth preſerves its natural colour. If the blackeſt, and moſt flinty flint be expoſed to the weather, in leſs than a year, its ſurface will change colour, and if we have patience to purſue this experiment, we ſhall ſee it by degrees loſe its hardneſs, tranſparency, and other ſpecific characters, and approach every day nearer and nearer the nature of argile.

What happens to flint, happens to ſand; each grain of ſand may be conſidered as a ſmall flint, and each flint as a maſs of grains of ſand, extremely fine and exactly grained. The example of the firſt degree of decompoſition of ſand is found in the brilliant and opake powder called *Mica*, in which potters earth and ſlate are always diffuſed. The entirely tranſparent flints, the *Quartz*, produce, by decompoſition, fat and ſoft talc, as petrifiable and ductile as clay: and it appears to me that talc is a mediate term between glaſs or tranſparent flint and argile; whilſt on the contrary, coarſe and impure flint, by decompoſing, paſſes to potters earth without any intermedium.

Our factitious glaſs proves alſo the ſame alterations: it decompoſes in the air, and periſhes in ſome degree by remaining in the earth. At firſt its ſuperficial ſcales exfoliate; by working it we perceive brilliant ſcales fly from it; but when its decompoſition is more advanced, it crumbles between the fingers, and is reduced into a very fine white talcy powder: and art has even imitated nature in the decompoſition of glaſs and flint.

CHAP. II.

OF HILLS—SEAS—RIVERS—AND LAKES—THEIR NATURE AND PROPERTIES.

IF, in place of that beautiful variety of hills and vallies, of verdant foreſts, and refreſhing ſtreams, which at preſent delight our ſenſes, the earth were an even and regular plain; a dreary ocean would then cover the whole globe, and it would be merely the habitation of the ſcaly race.

It cannot therefore to be ſuppoſed that even at firſt the ſurface of the earth was perfectly regular; and ſince its firſt production, a variety of cauſes, the motion of the waters, the ſubterraneous fires, the wind, and other external cauſes have contributed much to this irregularity.

Next to the elevation of mountains, the depths of the ocean form the greateſt irregularities; this depth is very different even at great diſtances from land; it is ſaid there are parts above a mile deep, but theſe are few, and the moſt general profundities are from 60 to 150 fathom. The gulphs bordering on the coaſts are much ſhallower, and the ſtraits have generally the leaſt depths.

In general, the depths in openſe as increaſe or diminiſh pretty regularly, being for the moſt part deeper the farther from land. But there are places in the middle of the ſea, as at the *Abrolkos* in the Atlantic, where large ſhelves appear; and in other places, there are vaſt ſand banks, to which the Eaſt India-men are no ſtrangers.

Along coaſts, the depths are alſo very irregular. Yet it may be laid down as a certain rule, that the depth is always proportioned to the height of the coaſt: The ſame remark is equally applicable to rivers.

The higheſt mountains in Aſia are Mount Taurus, Mount Imaus, Caucaſus, and the mountains of Japan, all of which are higher than any in Europe: the higheſt mountains in Africa, *i. e.* the great Atlas, and the mountains of the moon, are at leaſt as high as thoſe in Aſia, and the higheſt of all are in South America, particularly thoſe of Peru, which are more than 3000 fathoms higher than the level of the ſea. In general the mountains between the tropics are loftier than thoſe of the temperate zones, and theſe more than thoſe off the frigid zones, ſo that the nearer we approach the equator, the greater are the inequalities of the earth: theſe inequalities, although very inconſiderable with reſpect to us, are nothing when conſidered with reſpect to the terreſtrial globe. Three thouſand fathom difference to 3000 leagues diameter, is one fathom to a league, or one foot to 2300 feet, which on a globe of 2 feet and a half diameter, does not make the 6th part of a line. Hence this earth, which appears to us to be croſſed and cut by the enormous height of the mountains, and by the frightful depth of the ſea, is, when we conſider its ſize, ſo very ſlightly furrowed with irregularities, that they can make no variation upon its general figure.

Upon the continents the mountains are continued, and form chains. In iſlands they appear to be more interrupted and iſolated, and generally raiſed above the ſea, in form of a cone or pyramid, and are called *peaks*. The peak of Teneriffe is one of the higheſt mountains on the earth; it is near a mile and a half high perpendicular from the level of the ſea; the peak of St George in one of the Azores, and the peak of Adam in the iſland of Ceylon, are alſo exceedingly high. All theſe peaks are compoſed of rocks, piled one above another, which omit each from their ſummits, fire, cinders, bitumen, minerals, and ſtones. There are even iſlands which are preciſely only as tops of mountains, as the iſland of St Helena, Aſcenſion, moſt of the Azores, and Canaries; and we muſt remark, that in moſt of the iſlands, promontories, and other projecting lands in the ſea, the middle is always the higheſt, and they are generally ſeparated by chains of mountains, which divide them in their greateſt length, as the Grampian mountains in Scotland, which extend from eaſt to weſt, and divide Great Britain into two parts; it is the ſame with the iſlands Sumatra, Lucon, Borneo, Celebes, Cuba, and St Domingo, and alſo Italy, which is traverſed through its whole length by the Apenines.

With reſpect to the depths on the ſurface of the earth, thoſe of the ocean are, no doubt, the greateſt, but as theſe can only be diſcovered by ſounding, we ſhall take notice of none but ſuch as appear on the dry land. The precipices then which are between rocks, are formed by the ſinking of rocks, the baſe of which ſometimes gives way more on one ſide than the other, by the action of the air and froſt, which ſplits and divides them; and by the impetuous fall of torrents, which opens paſſages, and carries along with them whatever oppoſes their violence. But theſe abyſſes, that is, theſe vaſt and enormous precipices found at the ſummit of mountains, and to the bottom of which it is not poſſible ſometimes to deſcend, although they are above a mile or half a mile round, have been formed by the operation of fire. They were formerly the funnels of volcanoes, and all the matter which is there deficient, has been ejected by the action and exploſion of theſe fires, which are ſince extinguiſhed for want of combuſtible matter.

The abyſs of mount Ararat, of which M. Tournefort gives a deſcription in his voyage to the Levant, is ſurrounded with black and burnt rocks, as the abyſſes of Etna, Veſuvius, and other volcanoes will be, when they have conſumed all the combuſtible matters they include.

Plot, in his natural hiſtory of Staffordſhire, mentions a kind of gulph, which has been ſounded to the depth of 2600 perpendicular feet, without finding either water or bottom.

Great cavities and deep mines are generally in mountains, they never deſcend to a level with the plains; ſo we learn from them the internal ſtructure of the mountain only, and not that of the globe.

It was long thought that the chains of the higheſt mountains run from weſt to eaſt, till the contrary direction was diſcovered in the new world; but no perſon before Mr Bourguet diſcovered the ſurprizing regularity of the ſtructure of thoſe great maſſes. After having croſſed the Alps, thirty times in fourteen different parts, twice over the Apenine mountains, and made divers tours in the environs of theſe mountains, and in mount Jura, he found that the contours of all mountains bear a ſtriking reſemblance to the works of regular fortifications. When the body of the mountain runs from eaſt to weſt, it forms prominences, which face as much as poſſible the north and ſouth; this admirable irregularity is ſo ſtriking in vallies, that we ſeem to walk in a very regular covered way; if, for example, we travel in a valley from north to ſouth, we perceive that the mountain which is on the right forms projections or angles which front the eaſt, and thoſe of the mountain on the left front the weſt, ſo that, in fact, the prominent and concave angles, on each ſide, correſpond with one another alternately. The angles which mountains form in great vallies are leſs acute, becauſe the direction is leſs ſteep, and as they are farther diſtant from each other; and in plains they are not ſo perceptible as in the courſe of rivers, which generally take up their elbows; the middle of them naturally anſwer to the moſt ſtriking projections, or the moſt advanced angles of mountains; and this is the cauſe of the ſerpentine courſe of rivers. It is aſtoniſhing ſo obvious a fact ſhould have remained ſo long unobſerved, for when in a valley the inclination of one of the mountains which border it, is leſs ſteep than that of the other, the river takes its courſe much nearer the ſteepeſt mountain, and does not flow through the middle of the valley.

Theſe obſervations might be confirmed by a number of facts. The mountains of Switzerland, for inſtance, are ſteeper on the ſouth-ſide than on the north, and on the weſt than on the eaſt ſide. But the moſt ſtriking example is afforded by the mountains of Chili and Peru. The Cordeliers are exceedingly ſteep on the weſt ſide, but they have a gradual declivity towards the eaſt, and they terminate in vaſt plains, which are terminated by the largeſt rivers in the world.

This is a conſequence of the parallel direction of the different chains of mountains; and beſides the whole continent of Europe and of Aſia is broader from eaſt to weſt than from north to ſouth; for there are two modes of conceiving this direction. In the long and narrow continent of South America, there is only one principal chain of mountains, that is, from eaſt to weſt, or from weſt to eaſt; in fact, it is in this direction all the rivers of America flow, becauſe, excepting the Cordillieros, there are no very extenſive chains of mountains, and none whoſe directions are parallel to them. In the old as well as the new Continent, moſt of the waters have their greateſt extent from weſt to eaſt, and moſt of the rivers flow in this direction, which is owing to another cauſe, to wit, that there are many long chains of mountains parallel to each other, whoſe direction is from weſt to eaſt, and becauſe the rivers and other ſtreams are obliged to follow the intervals which divide theſe chains of mountains, conſequently one ſingle chain of mountains, directed from north to ſouth, will produce rivers, whoſe direction will be the ſame as that of thoſe which iſſued from many chains of mountains, whoſe common direction is from eaſt to weſt; and it is for this particular reaſon, that the rivers of America have this direction common with thoſe of Europe, Africa, and Aſia.

A remarkable phenomenon has been obſerved with reſpect to rivers, which is, that in the inland parts at a diſtance from the ſea, they flow in a direct line, but in proportion as they approach their mouths they aſſume more of a winding courſe. In large rivers there is a conſiderable eddy along the banks; and the nearer the ſea this eddy is the greater. The ſurface of the water in rivers is by no means level from bank to bank; on the contrary, the middle of the ſtream is higher or lower than the water of the ſides according to circumſtances. When a river ſwells ſuddenly by the melting of ſnow or any other cauſe, the middle of the ſtream is ſenſibly higher than the ſides: in one inſtance the elevation is ſaid to have been as great as three feet. On the other hand, when rivers approach their mouths, the water near the ſides is commonly more elevated than that in the middle.

The inundation of the Nile, though nothing can be more natural has long afforded matter for curious and doubtful ſpeculation. It is the rain which falls in Abyſſinia and Ethiopia which occaſions the ſwelling and inundation of this river, though the north wind muſt be regarded as the primitive cauſe. 1ſt, Becauſe it drives the clouds which convey this rain from the coaſt of Abyſſinia: 2ndly; becauſe blowing againſt the two mouths of the Nile, it forces the waters back againſt the ſtream, and thus prevents them from pouring into the ſea in too great a quantity: this circumſtance may every year be relied on, when the wind being at the north, and ſuddenly veering to the ſouth, the Nile in one day loſes what it gathered in four.

Inundations are generally greateſt in the ſuperior parts of rivers; becauſe the velocity of a river uniformly increaſes until it empties itſelf in the ocean. But as the theory of running waters is ſubject to many difficulties, we ought carefully to ſtudy the peculiarities of particular rivers.

The greateſt rivers of Europe are, the Wolga, whoſe courſe from Reſchow to Aſtracan on the Caſpian Sea, is about 650 leagues; the Danube, which runs about 450 leagues, from the mountains of Switzerland to the Black Sea; the Don, from the ſource of the Soſna, which receives it, to the Black Sea, runs 400 leagues; the Nieper, which alſo falls into the Black Sea, after running 350 leagues; the Duine, which empties itſelf in the White Sea, runs a courſe of about 300 leagues.

The greateſt rivers of Aſia are, the Hoanho, which riſes at Raja Rilron, and which, after running 850 leagues, falls into the middle of the gulf of Changi, in the Chineſe Sea; the Jeniſca, which runs from Lake Leling to the northern ſea of Tartary, a courſe of about 800 leagues ; the Oby, from Lake Kila to the North Sea beyond Waigat's Straits, runs about 600 leagues ; the Amour, in Eaſt Tartary, has a courſe of 575 leagues, from the head of the river Kerlon, which falls into it, to the ſea of Kamſchatka. The river Menan may be meaſured from the ſource of the Longmu, which falls into it, to its mouth at Poulo-condor ; the Kian, which runs about 550 leagues, from the ſource of the Kinxa, which it receives till it diſcharges itſelf in the ſea of China ; the Ganges, which has a courſe nearly of the ſame extent with the Kian ; the Euphrates, computing from the ſource of the Irma, which it receives, runs about 500 leagues ; the Indus, which runs about 400 leagues, and falls into the Arabian Sea on the eaſt of Guzarat ; and the Sirderoias, which runs about 400 leagues, and falls into Lake Aral.

The greateſt rivers of Africa are, the Senegal, the courſe of which, comprehending the Niger, which is but a continuation of it. and the ſource of the Gambarou, which falls into the Niger, is about 1125 leagues ; the Nile, which riſes in upper Ethiopia, runs about 970 leagues. There are others, the courſes of which are but little known, as the Zaira, the Coanza, the Couama, and the Quilmanci, but each of which we are acquainted with to the extent of 400 leagues.

In America, the river of the Amazons runs above 1200 leagues. The courſe of the river St Lawrence in Canada is more than 900 leagues. The river Miſſiſippi runs above 700 leagues. The Plata extends more than 800 leagues, from its mouth to the ſource of the Parana, which it receives. The Oronoko runs above 575 leagues, if we reckon from the ſource of the river Caketa, near Paſto, a part of which falls into the Oronoko, and a part runs towards the river of the Amazons. The Madera which falls into the Amazons extends above 660 leagues.

In order to aſcertain the quantity of water diſcharged into the ſea by all the rivers, we ſhall ſuppoſe the one half of the ſurface of the earth to be ſea, and the other half to be dry land. We ſhall alſo ſuppoſe that the mean depth of the ſea is 230 fathoms. The total ſurface of the earth is 170,981,012 ſquare miles, and that of the ſea is 85,490,506 ſquare miles, which when multiplied by one fourth, the depth of the ſea, gives 21,372,626 cubic miles for the quantity of water contained in the whole ocean. Now that we may pretty nearly aſcertain the quantity of water diſcharged into the ſea from the rivers, let us take the river Po, for example, which runs through Lombardy, and waters a country 380 miles long. According to Riccioli, the breadth of the Po is 100 feet, and its depth is 10 feet ; and it runs at the rate of 4 miles in an hour. Conſequently, the Po diſcharges into the ſea 200,000 cubical perches of water in an hour : and as a cubic mile contains 125,000,000 cubic perches, the Po will require 26 days to diſcharge into the ſea, a cubic mile of water. It now only remains to determine the proportion that the Po bears to all the other rivers of the earth taken together, which cannot be done exactly. But, to come as near to the truth as poſſible, let us ſuppoſe the quantity of water, which the ſea receives from the great rivers in every country, to be proportioned to the extent of the ſurfaces of thoſe countries ; and, conſequently, that the country watered by the Po, and by the rivers that fall into it, is to the total ſurface of the dry land, as the Po is to all the rivers of the earth. Now, from the moſt accurate charts, it appears, that the Po waters a country 380 miles long, and 120 broad, which makes 45600 ſquare miles. But the ſurface of the dry land is 85490506 ſquare miles; conſequently, the quantity of water conveyed to the ſea by all the rivers, will be 1874 times greater than the quantity diſcharged by the Po. But, as 26 rivers, equal to the Po, furniſh a cubic mile of water every day, it follows, that, in the ſpace of a year, 1874 rivers equal to the Po, will convey to the ſea 26308 cubic miles of water; and that in 812 years, all theſe rivers would diſcharge 2137·626 cubic miles, which is a quantity equal to what is contained in the ocean; of courſe, if the ocean were empty, 812 years would be neceſſary to fill it from the rivers.

There reſults from this calculation, that the quantity of water evaporated from the ſea, and which the winds convey on the earth, producing rivulets, ſtreams, and rivers, is from 20 to 21 inches a year, or about two thirds of a line each day; this is a very trifling evaporation when even doubled or trebled, in order to eſtimate the water which falls back into the ſea, and which is not conveyed over the earth. Mr *Halley* has demonſtrated that the vapours which riſe above the ſea, and which the winds convey over the whole earth, are ſufficient to form all the rivers, and to contain all the waters which are on the ſurface of the earth.

In the old continent there are about 430 rivers, which fall directly into the ocean, or into the Mediterranean and Black Seas, and in the new continent, ſcarcely 180 rivers are known, which fall directly into the ſea. In this number however, I have included none but ſuch as are as large as the river Somme in Picardy. All theſe rivers carry to the ſea a great quantity of mineral and ſaline parts, which they have waſhed from the different ſoils through which they have paſſed. The particles of ſalt which are known to be eaſily diſſolved, are conveyed to the ſea by the water. Some naturaliſts, and among the reſt Halley, have pretended that the ſaltneſs of the ſea proceeded only from the ſalts of the earth, which the rivers tranſport thither. Others aſſert, that the ſaltneſs of the ſea is as ancient as the ſea itſelf, and that this ſalt was created only that it might not corrupt, but it may be well ſuppoſed that the ſea is preſerved from corruption by the agitations of the wind, and the flux and reflux, as much as by the ſalt it contains; for when it is kept in a barrel, it corrupts in a few days, and Boyle relates that a mariner becalmed for 13 days, found at the end of that time the ſea ſo infected, that if the calm had not ceaſed, the greateſt part of his people on board would have periſhed. The water of the ſea is alſo mixed with a bituminous oil, which gives it a diſagreeable taſte, and renders it very unhealthy. The quantity of ſalt contained in ſea water, is about 1·40th part, and the ſea is nearly equally ſaline throughout at top as at the bottom, under the line, and at the Cape of Good Hope, although there are ſeveral parts, as on the Moſambique Coaſt, where it is ſalter than elſewhere. It is alſo aſſerted not to be ſo ſaline under the Arctic Zone, which may proceed from the great quantity of ſnow, and the great rivers which fall into thoſe ſeas, and becauſe the heat of the ſun produces but little evaporation there, in compariſon of that produced in hot climates.

There are rivers which loſe themſelves in the ſands, and others which ſeem to precipitate into the bowels of the earth: the Guadalquiver in

Spain, the river of Gottenburg in Sweden, and the Rhine itſelf loſe themſelves in the earth. It is aſſerted, that in the weſt part of St Domingo, there is a mountain of a conſiderable height, at the foot of which are ſeveral large caverns that receive the rivers and brooks, whoſe fall is heard ſeven or eight leagues off. The rivers, however, which diſappear in the earth are very few; and they ſeem not to deſcend very deep. And it is probable that like the Rhine they loſe themſelves by dividing and diſappearing through a large ſurface of land, of which there are many examples in Africa, Perſia, Arabia, &c.

The rivers of the north carry down to the ſea prodigious quantities of ice, which form thoſe enormous maſſes ſo dangerous to the mariner. thoſe in the ſea of Nova Zembla and in the ſtraits of Waigat, come from the Oby, and, perhaps, from the Jeniſca, and other great rivers in Siberia and Tartary: thoſe of Hudſon's ſtraits, from Aſcenſion bay, into which many rivers in North America empty themſelves; and thoſe of Terra del Fuego, from the ſouthern continent. If fewer of them are found in the northern coaſts of Lapland than in thoſe of Siberia and Waigat's ſtraits, it is becauſe all the Lapland rivers fall into the gulf of Bothnia, and none of them into the North Sea.

The ocean ſurrounds the whole globe without any interruption of continuity, and the tour of the globe may be made by paſſing the point of South America, but it is not yet known whether the ocean ſurrounds the northern part of the globe in the like manner; and all mariners who have attempted to ſail from Europe to China by the north-eaſt or north-weſt, have equally miſcarried in their enterpriſes.

The ſeas which are called Mediterranean, are properly branches from the great ocean, by which they are ſupplied. Lakes differ from the Mediterranean ſeas, becauſe they do not receive any water from the ocean; for on the contrary, if they have communication with the ſeas, they furniſh them with water; thus the Black Sea, which ſome geographers have regarded as connected with the Mediterranean, and conſequently as an appendix of the ocean, is only a lake; becauſe, inſtead of receiving water from the Mediterranean, it ſupplies it with ſome, and flows with rapidity through the Boſphorus into the lake called the ſea of Marmora, and thence through the ſtrait of the Dardanelles into the Grecian ſea. The water of the Black Sea is leſs clear, and much leſs ſaline than that of the ocean. No iſland is to be met with in this ſea: tempeſts are very violent here, and more dangerous than in the ocean; becauſe the whole body of the waters being contained in a baſon, which may be ſaid to have no outlet, they have a kind of whirling motion, when they are agitated, which ſtrikes the veſſels on every ſide with an intolerable violence.

Next to the Black Sea, the greateſt lake in the univerſe is the Caſpian Sea, whoſe extent in length from north to ſouth is about 300 leagues, and ſcarcely more than fifty broad, computing it in a moderate proportion. This lake receives the Volga, which is one of the greateſt rivers in the world; and alſo ſome other conſiderable rivers, as the Keir, the Fay, and the Gempo; but what is ſingular, is, that it does not receive any on its eaſtern ſide throughout this whole length of 300 leagues. There are ſome ſmall iſlands in the Caſpian Sea, and its waters are much leſs ſaline than thoſe of the ocean. In this ſea no large veſſels are uſed, as navigation is very dangerous in it, becauſe it is ſhallow, and many banks and ſhoals are ſcattered under the ſurface of the water.

There are lakes which like pools, neither receive nor emit rivers. There are others which do receive rivers, and from which others run; and laſtly, ſome which only receive rivers. The Caſpian Sea and the lake Aral are of the laſt kind, they receive the waters of many rivers, and contain them. Thus the Dead Sea receives the Jordan, though no river iſſues from it. In Aſia Minor there is a ſmall lake of the ſame kind, which receives the waters of a river the ſource of which is near Congi, and which, like the preceding, has no other mode than evaporation, to throw off the waters it receives; there is one much larger in Perſia, on which the town of Marago ſtands, its figure is oval, and it is about ten or twelve leagues long, by ſix or ſeven broad; it receives the river Tauris, which is not very conſiderable. There is alſo a ſimilar ſmall lake in Greece, about 12 or 15 leagues from Lepanto, and there are ſome of the ſame ſort both in Africa and America.

The moſt general and largeſt lakes, however, are thoſe which having received another river, or many ſmall rivers, give riſe to other great rivers. It is worthy of remark that all lakes from which rivers derive their origin; all thoſe which fall into the courſe of rivers, and which carry their water to them, are not ſaline. But almoſt all thoſe, on the contrary, which receive rivers, without other rivers iſſuing from them, are ſaline, which ſeems to favour the opinion we have laid down on the ſubject of the ſaltneſs of the ſea, for evaporation cannot carry off fixed ſalts, and conſequently thoſe which rivers carry into the ſea remain in it; and although river water appears to taſte ſweet, we know that it contains a ſmall quantity of ſalt, and in courſe of time the ſea muſt have acquired a conſiderable degree of ſaltneſs, which muſt ſtill continue to increaſe. Hence, in my opinion the Black Sea, the Caſpian Sea, the lake Aral, the Dead Sea, &c. are become ſalt.

The lakes which are any ways remarkable, are, the Dead Sea, the waters of which contain much more bitumen than ſalt; this bitumen, which is called the *Bitumen of India*, is no other than the Aſphaltum, which has induced ſome authors to denominate this ſea, *Lake Aſphaltum.* The land which borders on this lake contains a great quantity of bitumen, and may have applied the fables to this lake, which the poets feign of the lake Avernus, that no fiſh could live in it, and that birds which attempted to fly over it were ſuffocated. But neither of theſe lakes produce ſuch mortal events; fiſh live in both, birds paſs over them, and men bathe in them without the leaſt danger. A petrifying lake in Iceland, is alſo mentioned, and the lake Neagh in Ireland, has alſo the ſame property of apparently turning wood, &c. into ſtone; but theſe petrifications are no other than incruſtations like thoſe made by the water of Arcueil.

CHAP.

CHAP III.

OF TIDES, OF WINDS, REGULAR AND IRREGULAR—MONSOONS—HURRICANES—WHIRLWINDS—WATER-SPOUTS.

WATER, like every other fluid, remains ſmooth and tranquil, unleſs put in motion by ſome foreign cauſe. All the waters of the ocean are collected in the loweſt places upon the ſurface of the earth; and hence the motion of the ſea muſt proceed from external cauſes. The chief motion is that of the tides, which riſe and fall alternately, and which produce a perpetual motion from eaſt to weſt. Theſe two motions have an unvariable relation to the motions of the moon. During the full and new moons, this motion from eaſt to weſt is moſt obſervable, as well as that of the tides, which ebb and flow upon moſt coaſts, every 6½ hours. It is always high tide when the moon arrives at the meridian; and it is always low tide, when the moon is at the greateſt diſtance from it. The motion from eaſt to weſt is perpetual; becauſe when the tide riſes, it puſhes an immenſe body of water from eaſt to weſt, and the ebbing ſeems only to be occaſioned by the ſmaller quantity of water which is then impelled weſtward.

This motion is attended with the following circumſtances: 1ſt, It is more apparent at the full and new moon than at the quadratures. It is alſo more violent in ſpring and autumn than in any other ſeaſon; and is weakeſt at the ſolſtices. This is owing to the combined attraction of the ſun and moon 2d, The direction and quantity of this motion is often varied by the winds, particularly by thoſe which blow inceſſantly from the ſame quarter. 3d, It is worthy of remark, that when one part of a fluid is moved, the motion is communicated to the whole. During the tides, therefore, a great part of the ocean is put in motion; and, of conſequence, the whole ocean, from top to bottom is agitated at the ſame time.

In order to throw a little more light upon this ſubject, let us attend to the cauſes which produce the tides. We may therefore remark that the moon acts upon the earth by a power called gravity or attraction. This power penetrates the whole globe, and is exactly proportioned to the quantity of matter, and decreaſes as the ſquares of the diſtances increaſe. Let us now examine what effects this power muſt produce upon the waters when the moon comes to the meridian of any place. The ſurface of the water immediately under the moon is therefore nearer that planet than any other part of the earth, conſequently, that part of the ſea muſt be elevated toward the moon, and the ſummit of this eminence muſt be oppoſite to the moon's center. To produce this eminence the waters upon the ſurface, as well as thoſe at the bottom, contribute their ſhare, in proportion to their diſtances from the moon, which acts upon them in the invers ratio of the ſquares of their diſtances. Hence the ſurface of this part of the ſea is firſt elevated; the ſurface of the adjacent parts is alſo elevated, but not ſo much; and the waters at the bottom of all theſe parts are raiſed by the ſame cauſe. Thus as the whole portion of water under the moon is raiſed, the waters at a diſtance,

tance, upon which no attraction is exerted, muſt neceſſarily ruſh forward with precipitation to ſupply the place of thoſe which were drawn towards the moon. It is in this manner that the high tide is produced, which is more or leſs perceiveable in different coaſts, and which agitates the ſea not only at the ſurface, but at the greateſt depths. The ebb is a conſequence of the natural diſpoſition of the water, which when no longer acted upon by the moon, ſubſides, and returns to occupy thoſe ſhores from which it had been forced to retire by an external cauſe.

Nothing is more irregular in our climates than the courſe of the winds; but there are countries where this irregularity does not exiſt, and others where the wind blows conſtantly in the ſame direction.

There are ſeveral cauſes which influence the motions of the air, but the moſt powerful is the heat of the ſun, which by rarifying the air, produces an influx of the cold air, which is a heavier fluid, and conſequently preſſes in upon that which is rarified and light, and produces a ſtream or current of air. In the torrid zone this effect is more uniformly manifeſt than in other parts of the world. In the regions near the equinoctial line, a continual rarefaction is produced by the ſun, and a conſtant current of air follows that luminary in his progreſs from eaſt to weſt. This eaſterly wind blows ſo generally in the Pacific Ocean, that the ſhips which ſail from Acapulca to the Philippines, perform a voyage of 2700 leagues in leſs than two months.

About 28 or 30 degrees on this ſide of the line, the weſt winds are equally conſtant, and for this reaſon, the veſſels returning from the Weſt Indies to Europe do not purſue the ſame route as in going out.

The winds which blow continually for ſome months, are generally followed by contrary winds, and mariners are obliged to wait for that which is favourable to them; when theſe winds change, a calm or dangerous tempeſt enſues for ſeveral days, and ſometimes for a month.

Theſe general winds, occaſioned by the rarefaction of the atmoſphere, combine differently by different cauſes in different climates. In part of the Atlantic Sea, under the temperate zone, the north wind blows almoſt conſtantly during the months of October, November, December, and January, which is the reaſon why theſe months are the moſt favourable to embark from Europe to India, in order to paſs the line by the favour of theſe winds; and it is known, that ſhips which quit Europe in the month of March do not arrive ſooner at Brazil than thoſe which ſail in the month of October. The north wind almoſt continually reigns during winter in Nova Zembla, and the other northern coaſts. The ſouth wind blows during the month of July to Cape Verd, when the rainy ſeaſon, or winter of theſe climates ſets in: at the Cape of Good Hope the north weſt wind blows during the month of September: at Patna, in India, this north weſt wind blows during the months of November, December, and January, and produces heavy rains; but the eaſt wind blows during the other nine months.

In the kingdom of Guzarat, and on the coaſts of the neighbouring ſea, the north winds blow from March till September; and during the other months of the year ſouth winds almoſt always prevail. The Dutch, in order to return from Java, generally ſet ſail in the month of January or February by an eaſterly wind which is felt as far as 18 degrees northern latitude, after which they meet with ſouth winds which carry them to St Helena.

In the Mediterranean, the winds blow from the land towards the ſea at the ſun's ſetting, and, on the contrary, from the ſea towards the land at its riſing. Hence in the morning it is an eaſterly wind, and in the evening a weſterly wind. The ſouth wind, which is rainy, and which generally blows at Paris, Burgandy and Champagne at the beginning of November, and which gives place to mild and temperate breezes, produces the fair weather vulgarly called the ſummer of St Martin's.

On the ſea, the winds are more regular than at land, becauſe the temperature of the ſea is more equal than that of the land. For the temperature of the latter is altered by a variety of cauſes; ſuch as electricity, volcanoes, exhalations from the earth, the exploſion of meteors, &c.

In general, on the ſea, the eaſt wind and thoſe which come from the poles, are ſtronger than the weſt and thoſe which proceed from the equators. On the land, on the contrary, the weſt and ſouth winds are more or leſs violent than the eaſt and north winds, according to the ſituation of the climates.

Contrary currents are often obſerved in the air; clouds that move in one direction, and others which are higher or lower than the firſt, proceed in a direction perfectly oppoſite. This contrariety of motion however does not remain very long, and it is commonly produced only by the reſiſtance of ſome clouds to the action of the wind, and by the reaction of the direct wind, which reigns ſolely as ſoon as the obſtacle is removed.

The winds are more violent in mountainous places than in plains; and the higher we aſcend, the more the power of the wind increaſes, until we reach the common height of the clouds, which is about one quarter or one third of a league perpendicular height. Beyond that height, the ſky is generally ſerene, eſpecially in ſummer, and the wind is ſaid to be even imperceptible on the tops of the higheſt mountains.

A current of air increaſes in velocity, like a current of water, where the ſpace of its paſſage is contracted. The wind which is but ſlightly felt in a wide and open plain, becomes violent in paſſing through a narrow paſſage between two mountains, or between two lofty buildings; and the point of the moſt violent action of the wind is above the ſtructures or mountain ſtraits. For the air being compreſſed by the reſiſtance of theſe obſtacles, has a greater maſs, denſity and the ſame velocity ſubſiſting; the effort or guſt of wind, the *momentum* becomes much ſtronger; this is the cauſe that near a church, or a caſtle, the winds ſeem to be much ſtronger than they are at a certain diſtance from theſe edifices. I have often remarked, that the wind reflected from a building that ſtands by itſelf, is ſtronger than the direct wind that produced it. And ſince I have endeavoured to diſcover the reaſon of this, I have been able to find no other than the above. The impelled air compreſſes againſt the building, and is reflected, not only with its former velocity, but alſo with a greater body, which, in fact, renders its action much more violent.

Particular winds, whether direct or reflected, are more violent than thoſe which are general. An uniformly continued ſtream of air produces not ſuch havock as the fury of thoſe winds which blow in ſudden guſts. The predominancy of certain winds, in certain parts, has occaſioned a general diviſion of them into zones, though it is not to be underſtood that their effects are invariable. The eaſt wind, which extends 20 or 30 degrees on each ſide of the equator, occupies the torrid zone, and the north wind the frigid zones. With regard to the temperate zones, the winds which reign there, are, if I may uſe the expreſſion, only currents of air, whoſe motion is compoſed of thoſe two winds whoſe direction tends to the weſt. And with reſpect to the weſterly winds, whoſe direction tends to the eaſt, and which often prevail in the temperate zone, whether in the Pacific or Atlantic oceans, they may be conſidered as winds reflected by the continents of Aſia and America, but originally derived from the eaſt and north winds.

The monſoons, or trade winds, which have an alternate motion, are ſubject to many deviations. Some continue for a longer, ſome for a ſhorter time; and they alſo differ in their extent, and in their degree of violence. In the Indian ocean, for inſtance, between Africa and India, as far as the Moluccas, the eaſt wind begins in January, and laſts till June. In the month of Auguſt or September, the contrary motion begins; and the weſt winds reign during three or four months. In the intervals of theſe monſoons, that is, at the end of June, in the month of July, and beginning of Auguſt, there is no wind on that ſea; but it is infeſted with violent ſtorms from the north.

There are winds which may be regarded as peculiar to certain coaſts; for example, the ſouth wind is almoſt continual on the coaſts of Chili and Peru. It begins about the 46th degree of ſouth latitude, and extends beyond Panama, which renders the voyage from Lima to Panama much eaſier performed than the return. The weſtern winds blow almoſt continually, or at leaſt very frequently, on the Magellanic coaſts, and over the environs of the ſtrait of Maire. The north and north-weſt winds prevail almoſt continually on the Malabar coaſt; the north weſt wind is alſo very frequent on the coaſt of Guinea; and at a certain diſtance from that coaſt, in the open ſea, we meet with the north-eaſt wind very frequently. The weſterly winds reign on the coaſts of Japan, in the months of November and December.

The alternate or periodical winds, which we have juſt been ſpeaking of, are ſea winds. But there are alſo land winds, which are periodical, and return either at a certain ſeaſon, or in certain days, or even at certain hours. On the Malabar coaſt, for example, from the month of September to April a land wind blows from the eaſtern ſide: it generally commences at midnight and finiſhes at noon, and is not felt beyond 12 or 15 leagues from the coaſt, and from noon till midnight a weak ſea wind reigns, which comes from the weſt. On the coaſt of New Spain in America, and on that of Congo in Africa, land winds reign during the night, and ſea winds during the day. At Jamaica the winds blow from all quarters at once during the night, which hinders veſſels from either landing or ſetting out but in the day time.

The winds are however more irregular on the land than on the ſea, and more irregular in the higher lands than in plains. The mountains not only alter the direction of winds, but they even produce winds, which are either conſtant or variable according to different cauſes. The melting of the ſnow, which is upon the mountains, generally produces conſtant winds, which ſometimes remain very long. The vapours which are ſtopt by mountains, and which accumulate upon them, produce variable winds, very frequent in all climates.

mates. In the ſtraits, on all the projecting coaſts, at the extremity and in the environs of all promontories, peninſulas and capes, and in all narrow gulphs, ſtorms are frequent. But independent of theſe circumſtances ſome ſeas are much more tempeſtuous than others. The Indian ocean, the Japan Sea, the Magellanic Sea, that of the African coaſt beyond the Canaries, and on the other ſide towards the country of Natolia, the Red Sea, &c. are very ſubject to ſtorms. The Atlantic ocean is more ſtormy than the ocean, which, from its tranquillity, is called the *Pacific*. This ocean, however, is not abſolutely tranquil, except between the tropics, and about the temperate zones; and the more we approach the poles, the more we are ſubject to variable winds, whoſe ſudden change often occaſions tempeſts.

All continents are ſubject to variable winds, which often produce ſingular effects. In the kingdom of Caſſimir, which is ſurrounded by the mountains of Caucaſus, a very ſudden reverſe of ſeaſons is felt on mount Pirepenjale. In leſs than an hour's journey on it we paſs from ſummer to winter. A north and a ſouth wind, according to Bernier, blow perceptibly within 200 paces of one another. In the peninſula of India, which is traverſed from north to ſouth by the mountains of Gate, the extreme heats of ſummer are felt on one ſide of the mountains, and all the rigours of winter on the other. The ſame phenomenon is alſo obſerved at Cape Rozalgate in Arabia, and on the iſland of Ceylon.

In Egypt during ſummer, a ſouth wind prevails which is ſo hot as to ſtop reſpiration; and it raiſes ſo great a quantity of ſand, that the ſky ſeems covered with thick clouds. This ſand is ſo fine, and driven with ſuch force, that it penetrates every where, even into the cloſeſt coffers. When theſe winds laſt ſeveral days they occaſion epidemical diſeaſes, which are often attended with the moſt fatal conſequences.

The Cape of Good Hope is famous for its tempeſts, and the ſingular cloud which produces them. This cloud appears at firſt only like a ſmall round ſpot in the heavens, called by the ſailors *the Ox's Eye*, and which I imagine appears ſo little from its exceeding great height. In Natolia, a cloud ſimilar to the Ox's eye at the Cape, produces the ſame direful effects. In the ſea between Africa and America, eſpecially under the equator and in the neighbouring parts of it, theſe tempeſts very often ariſe; near the coaſt of Guinea ſome times three or four of theſe ſtorms are formed in a day. They are occaſioned and announced, like thoſe of the Cape, by ſmall black clouds. The reſt of the ſky is generally very ſerene, and the ſea calm. The firſt blaſt which iſſues from theſe clouds is furious, and would ſink ſhips in open ſeas, if they did not take the precaution to furl the ſails. It is principally in the months of April, May and June that theſe tempeſts are experienced on the Guinea ſea, becauſe no regular wind blows there during the ſeaſon.

All theſe tempeſts originate from winds which iſſue from a cloud, and their direction, is either to the north or ſouth, north eaſt or ſouth weſt, &c. But there are tempeſts called *hurricanes*, which are ſtill more violent, and in which the winds ſeem to blow from all the coaſts at once, with a circular motion, which nothing can reſiſt. A calm generally precedes theſe horrible tempeſts; but in an inſtant the fury of the winds raiſes waves as high as the clouds. Some parts of the ſea cannot be approached, becauſe they are continually infeſted with calms or whirlwinds. The Spaniards have therefore called theſe places *calms and tarnados.*

When from a ſudden rarefaction, or any other cauſe, contrary currents of air meet in the ſame ſpot, a whirlwind is produced. Perhaps the ſame effect takes place in another element. and gulphs or whirlpools may be no other than the eddies of the water formed by the action of two or more oppoſite currents. The Euripus, ſo famous for the death of Ariſtotle, alternately abſorbs and rejects the water ſeven times in twenty four hours. This gulph is near the Grecian coaſt. The Charybdis, which is near the ſtrait of Sicily, rejects and abſorbs the water thrice in twenty-four hours. We are uncertain, however, with reſpect to the number of alternate motions in other whirlpools. The greateſt known gulph is that of the Norway Sea, which is affirmed to be upwards of twenty leagues in circuit. It abſorbs for ſix hours water, whales, ſhips, and whatever is near it, and afterwards returns them in ſix hours.

A waterſpout is no other than a whirlwind at ſea. The vacuum which is occaſioned by the meeting currents makes the waters riſe up in the form of a cylinder, or rather of an inverted cone. In the travels of Mr Thevenot there is a very minute and circumſtantial account of the formation of a waterſpout, though there is reaſon to ſuſpect that the relation is not without ſome optical deceptions.

The firſt, ſays this celebrated voyager, that we ſaw, was on the northern coaſt, between us and the iſland Queſomo, about a gun-ſhot from the ſhip. We directly perceived water which boiled on the ſurface of the ſea about a foot high ; it was whitiſh, and appeared above that height like a thick black ſmoke, ſo that it properly reſembled ſome burning ſtraw, which only ſmoked. It made a noiſe like that of a torrent which runs with much rapidity in a deep valley. But this noiſe was mixed with another, ſimilar to the ſtrong hiſſing of ſerpents or vipers. A little while afterwards we perceived ſomething like a dark canal, or pipe, which bore a ſtrong reſemblance to ſmoke which aſcends towards the clouds, revolved with great velocity. This pipe appeared to be about the thickneſs of my finger, and the ſame noiſe continued. The duration of this ſpout was about a quarter of an hour. We then perceived another on the ſouth ſide of us, which began in the ſame manner as the preceding. Immediately a third and then a fourth ſprung up, both to the weſt. Each of them appeared like heaps of ſmoking ſtraw, and were accompanied with the ſame noiſe as the firſt. We afterwards ſaw three pipes or canals, which deſcended from the clouds, on thoſe places where the water was raiſed up, and each of them was as broad at the end faſtened to the cloud, as the broad end of a trumpet, and reſembled the teat of an animal, drawn perpendicularly down by an heavy weight. Theſe canals appeared of a darkiſh white, and were not ſtrait, but crooked in ſome places. They even were not perpendicular ; but on the contrary, from the clouds where they were joined to the parts, which drew in the water, they were very much bent. And what is ſingular, is, that the cloud which the ſecond of theſe three was faſtened to, having been driven by the wind, this canal followed it without breaking or quitting the place where it drew in the water, and paſſing behind the firſt canal, they were ſometimes croſſed like a St Andrew's

Croſs. At the beginning they were all three about the thickneſs of my finger, but afterwards the firſt of the three increaſed conſiderably. But the laſt which was formed ſcarcely remained longer than that which we ſaw on the north ſide. The ſecond on the ſouth ſide remained about a quarter of an hour, but the firſt on that ſide remained a little longer, and it was this which terrified us the moſt. At firſt its canal was as thick as my finger, afterwards as thick as my arm, then as my leg, and at laſt as the trunk of a large tree, which a man might compaſs with his arms. We diſtinctly perceived water through this tranſparent body which aſcended in a ſerpentine form. Sometimes it diminiſhed a little in ſize, ſometimes at top and ſometimes at bottom, then it reſembled exactly a ſoft tube with ſome fluid matter preſſed with the fingers, either upwards, to make this liquor deſcend, or at bottom to make it aſcend. After this it diminiſhed ſo much that it was thinner than my arm; afterwards it returned as thick as my thigh, and then again became very thin. At laſt, I ſaw that the water elevated on the ſurface of the ſea began to lower, and that the end of the canal which touched it divided and grew narrower, when a variation of the light removed it from our view.

CHAP IV.

OF VOLCANOES—EARTHQUAKES—THE FORMATION OF NEW ISLANDS—CAVERNS AND GROTTOES—BOGS AND FENS—CHANGES OF LAND INTO SEA, &c.

THE burning mountains called volcanoes, include in their bowels ſulphur, bitumen, and other materials which ſerve as aliment to a ſubterraneous fire, the effect of which is more violent than that of gunpowder or even of thunder. A volcano is a cannon of a very large ſize, the orifice of which is often more than half a league. This mouth vomits forth torrents of ſmoke, flame, rivers of bitumen, ſulphur, and melted metal, clouds of cinders and ſtones, and ſometimes it ejects enormous rocks to many leagues diſtance, which would baffle the utmoſt efforts of human ſtrength. The combuſtion is ſo terrible, and the quantity of burnt, melted, calcined, and vitrified materials which the mountain throws out, is ſo plentiful, that they enter cities, foreſts, cover the fields an hundred and two hundred feet in thickneſs, and form ſometimes hills and mountains. The action of this fire is ſo great, the force of exploſion ſo violent, that its reaction has been known to ſhake the earth, agitate the ſea, overthrow mountains, and deſtroy the moſt ſolid towns and edifices, even to very conſiderable diſtances. The natives of Iceland imagine that the roarings of the volcano are the cries of the damned, and its eruptions the effects of the rage and deſpair of theſe unhappy wretches.

All theſe phænomena, however, are only the effects of fire and of ſmoke. In the bowels of mountains, there are veins of ſulphur, bitumen and other inflammable ſubſtances, and alſo great quantities of pyrites, which ferment when expoſed to the air, or to moiſture, and produce exploſions in proportion to the quantity of inflammable matter they contain. A mixture of ſulphur, of filings of iron, and of water, buried at a certain depth below the ground, will exhibit, in miniature, all the appearances of a volcano. This mixture will ſoon produce exploſions perfectly ſimilar to thoſe of burning mountains.

There are three famous volcanoes in Europe, mount Ætna in Sicily, mount Hecla in Iceland, and mount Veſuvius in Italy near Naples. Mount Ætna has burnt from time immemorial. Its eruptions are very violent, and the matters it throws out are ſo plentiful, that they may be dug to the depth of 68 feet, where we meet with marble pavement, and the veſtiges of an ancient town which has been covered and buried under this thickneſs of matter ejected from the mount, in the ſame manner as the city of Herculaneum has been covered by the matter thrown out from Veſuvius. New mouths of fire were formed in 1650, 1669, and at other times. We ſee the flame and ſmoke of this volcano from Malta, which is about 60 leagues diſtant from it; it ſmokes continually, and it ſometimes vomits flames and matters of every kind with impetuoſity. In 1537, there was an eruption of this volcano, which occaſioned an earthquake in Sicily for 12 days, and which overthrew a very great number of houſes and ſtructures. It ceaſed only by the opening of a new fire mouth, which burnt every thing for five miles in the environs of the mountain. The cinders thrown out by the volcano were ſo abundant, and ejected with ſo much force, that they were driven as far as Italy; and veſſels which were departed to ſome diſtance from Sicily, were incommoded by them. Farelli deſcribes the conflagration of this mountain circumſtantially, and ſays the foot of it is 100 leagues in circumference.

This volcano has now two principal mouths, the one narrower than the other. Theſe two vents always ſmoke, but fire is never ſeen to iſſue from it, but during the time of eruptions. It is pretended that ſtones are found which it has thrown out to the diſtance of 60,000 feet*.

One of the laſt and moſt violent eruptions of mount Veſuvius was in in the year 1737. The mountain vomited by divers mouths large torrents of burning metallic matters, which diſperſed themſelves over the country and into the ſea. Monſ. de Montealegre, who communicated this relation to the Academy of Sciences, obſerved with horror one of theſe rivers of fire, and ſaw its courſe for ſix or ſeven miles till it reached the ſea. Its breadth was ſixty or ſeventy feet, its depth, twenty-five or thirty palms, and in certain bottoms or valleys, 220: the matter which flowed was like the ſcum which iſſues from the furnace of a forge.

In Aſia as well as in America there are a great number of volcanoes; but there is nothing peculiarly worthy of remark in any, except the violence with which ſome of them occaſionally emit the burning matters with which they are charged.

Near Fez in Africa, there is a mountain, or rather a cavern called *Beniguazevel*, which always emits ſmoke, and ſometimes flames. One of the iſlands of Cape Verd, called the iſland of *Fuego*, is only a large mountain which burns inceſſantly. This volcano, like the reſt, throws out many cinders and ſtones; and the Portugueſe who have attempted ſeveral times to erect habitations in this iſland, have been conſtrained to abandon this project, through the dread of the effects of the volcano. The Canaries, the Peak of Teneriff, and ſome of the higheſt mountains in the world, throw out fire, cinders, and large ſtones; from the top rivulets of melted ſulphur flow, which are diſtinguiſhable at a great diſtance.

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* See a moſt intereſting deſcription of this celebrated mountain in an elegant and entertaning production publiſhed by R. Moriſon and Son, intitled, "Brydone's Tour through Sicily and Malta."

The matters which volcanoes throw out, generally come forth in the form of a torrent of melted minerals, which inundates all the environs of theſe mountains. Theſe rivers of liquified matters extend even to conſiderable diſtances, and when cooled, form horizontal or inclined ſtrata, which for poſition are like the ſtrata formed by the ſediment left by the waters. But it is very eaſy to diſtinguiſh the ſtrata produced by the expanſion of matters thrown out by volcanoes, from thoſe which have the ſediment of the ſea for their origin. 1. Becauſe theſe ſtrata are not of an equal thickneſs: 2. Becauſe they contain only matters which are eaſily perceived to have been calcined, vitrified, or melted, and becauſe they do not extend to any great diſtance. When coal mines are opened, which are generally met with in argillaceous earth at a great depth, it ſometimes happens that theſe matters have taken fire. There are even mines of coal in Scotland, Flanders, &c. which have burnt for a number of years. The communication of the air ſuffices to produce this effect, but the fires which are lighted in theſe mines, produce only ſlight exploſions, and do not form volcanoes, becauſe all being ſolid and full in theſe places, fire cannot be excited, like that of volcanoes, in which there are cavities and void places where the air penetrates, which muſt neceſſarily extend the conflagration and augment the action of the fire, to the point in which we ſee it when it produces the terrible effects we have taken notice of.

There are two kinds of earthquakes, the one occaſioned by the action of ſubterraneous fires, and the exploſion of volcanoes, which are only felt at ſmall diſtances, and at the time when volcanoes act, or before they open. When the matters which form ſubterraneous fires, ferment, heat and inflame, the fire makes an effort on every ſide, and if it does not find a natural vent, it raiſes the earth and forces a paſſage for itſelf by throwing it out, which produces a volcano, whoſe effects are repeated, and laſt in proportion to the quantity of inflammable matters. If the quantity of matters which take fire, is not conſiderable, a commotion or an earthquake may enſue, without a volcano being formed. The air produced and rarefied by the ſubterraneous fire, may alſo find ſmall vents, by which it will eſcape, and in this caſe there will be only a ſhock without any eruption or volcano. But when the inflamed matter is in a great quantity, and confined by ſolid and compreſſed matters, then a commotion and volcano ariſes; but all theſe commotions form only the firſt kind of earthquakes, and can only ſhake a ſmall ſpace of ground. A very violent eruption of mount Ætna will occaſion, for example, an earthquake through the whole iſland of Sicily; but it will never extend to the diſtance of three or four hundred leagues. When any new mouths are formed in mount Veſuvius, there are earthquakes at Naples and in the neighbourhood of the volcano: but theſe earthquakes have never ſhook the Alps, and are not communicated to France or to other countries remote from the ſource of the phenomenon.

But there is another kind of earthquake, very different in its effects, and perhaps in its cauſes. There are earthquakes too which are felt at great diſtances, and which ſhake a long courſe of ground, without any new volcano or eruption appearing.

To underſtand rightly what may be the cauſes of this kind of earthquake, it muſt be remembered, that all inflammable matters capable of exploſion, produce, like gun powder, by inflammation, a great quantity of air; that this air produced by fire is in a ſtate of very great rarefaction; and that, by a ſtate of compreſſion in which it is found in the bowels of the earth, it muſt produce very violent effects. Let us therefore ſuppoſe, that, at a very conſiderable depth, as at about one or two hundred fathoms, pyrites, and other ſulphureous matters are to be met with; and that, by the fermentation produced by the filtration of the water, or other cauſes, they inflame. At firſt, theſe matters are not diſpoſed regularly by horizontal ſtrata, as the more ancient matters are, which have been formed by the ſediment of the waters. On the contrary, they are formed in perpendicular ſtrata, in caverns at the foot of theſe clefts, and in other parts where the water can act and penetrate. Theſe matters inflaming, will produce a great quantity of air or vapour, the ſpring of which, compreſſed in a ſmall ſpace, like that of a cavern, will not ſhake the earth immediately above, but will ſearch for paſſages, in order to make its eſcape. It will therefore naturally force its way through thoſe parts where it meets leaſt obſtruction, and will therefore proceed through the interſtices between the different ſtrata, or through any channel or caverns through which it can find a paſſage. This ſubterraneous air or vapour will therefore produce in its paſſage a noiſe and motion proportioned to its force and to the reſiſtance it meets with. And theſe effects will continue till it finds a vent, perhaps in the ſea, or till it has diminiſhed its force by being greatly expanded. This explanation correſponds entirely with all the phenomena which are obſerved reſpecting earthquakes. They proceed with a wave-like motion, and are felt at different places, not at the ſame inſtant, but at different times, in proportion to the diſtance.

We can alſo confirm what has been advanced, by connecting it with two other circumſtances. It is well known that mines exhale vapours, independent of the wind produced by the current of the water; we often ſee currents of unhealthy air and ſuffocating vapours. We alſo know that there are holes, abyſſes and deep lakes in the earth, which produce winds, like the lake Boleſlaw in Bohemia, &c.

From hiſtory we have innumerable inſtances of the dreadful and various effects of theſe terrible phenomena. Pliny, in his firſt book, chap. 84, relates, that in the reign of Tiberius, an earthquake happened, which overthrew twelve towns in Aſia; and in his ſecond book he mentions, an earthquake, which overthrew 100 towns in Lybia. In the time of Trajan, the town of Antiochus, and a great part of the adjacent country, were ſwallowed up by an earthquake; and, in the time of Juſtinian, in 528, it was again deſtroyed by a ſecond, with upwards of 40,000 of its inhabitants. And, ſixty years after, in the time of Saint Gregory, it felt the effects of a third earthquake, with the loſs of 60,000 of its inhabitants. In the time of Saladin, in 1182, moſt of the towns of Syria and Jeruſalem were deſtroyed by the ſame cauſe. In Calabria and Poh, there have been more of them than in any other part of Europe. In the time of Pope Pius XI. all the churches and palaces of Naples were overthrown, and above 30,000 of its inhabitants killed. In 1629, there were earthquakes in Pola, which deſtroyed 7000 perſons; and in 1638, the town of Saint Euphemia was ſwallowed up; and there remains only a ſtinking lake in its place. Raguſa and Smyrna were alſo almoſt deſtroyed. There was an earthquake in 1692, which extended into England, Holland, Flanders, Germany and France; it was chiefly felt on the ſea coaſts and rivers, and extended to a ſpace of at leaſt 2600 leagues ſquare. On the 16th of June, 1628, there was ſo horrible an earthquake in the iſland of St Michael, that the ſea near it opened, and, in one place where it was more than 150 fathoms deep, threw up an iſland more than a league and a half long, and upwards of 60 fathoms high.

Another earthquake happened in 1691, which began the 16th of July, and laſted in the iſland of St Michael till the 12th of the following month. Tercera and Fayal were agitated the next morning with ſo much violence, that they appeared to move; but theſe frightful ſhocks returned only four times; whereas, at St Michael's, they did not ceaſe a moment for 15 hours. The iſlanders having quitted their houſes, which they ſaw fall before their eyes, paſſed all that time expoſed to the injuries of the weather. A whole town, named Villa Franca, was overthrown to its very foundation, and moſt of the inhabitants buried under its ruins. Several plains roſe into hills; and ſome mountains became flat. A ſpring of water iſſued from the earth, which flowed for four hours, and which appeared dry all on a ſudden. The air and ſea, ſtill more agitated, reſounded with a noiſe like the roaring of a quantity of wild beaſts. Many perſons died with the fright, and the ſhips in the ports ſuffered dangerous ſhocks; and thoſe which were at anchor or under ſail, 20 leagues diſtant from the iſlands, ſuſtained great damage.

In the year 1646, the mountain of the iſland of Machian ſplit with terrible reports, by an earthquake; and ſo many fires iſſued through this opening, that they conſumed many negro-yards, and all that was in them. This prodigious crack is ſtill apparent; and it is called the path of Machian, becauſe it deſcends from the bottom like a road hollowed out, but which at a diſtance appears like a path.

At ſea the ſhock of an earthquake is felt at a conſiderable diſtance. M. Shaw relates, that, in 1721, being on board the Gazelle, an Algerine veſſel, mounting 50 guns, three violent ſhocks were felt one after the other, as if every time a weight of 20 or 30 tons had been thrown on the ſhip. This happened in a part of the Mediterranean which was 200 fathoms deep.

In countries ſubject to earthquakes, it happens, when a new volcano is formed, earthquakes ceaſe, and are only felt in the violent eruptions of the volcano, as is obſerved in the iſland of St Chriſtopher.

New iſlands are produced, either ſuddenly by the operation of ſubterraneous fires, or ſlowly by the accumulated ſediments of water. Seneca informs us, that, in his time, the iſland Theraſia ſuddenly emerged from the ſea; and Pliny relates, that thirteen iſlands aroſe all at once from the bottom of the Mediterranean. Upon this ſubject, however, we have ſome facts more recent, and leſs involved in obſcurity.

The 23d of May, 1707, at ſun riſing, near this ſame iſland of Theraſia, or Santorini, ſomething was ſeen like a floating rock in the ſea. Some perſons excited by curioſity, approached it, and found this ſhoal, which had iſſued from the bottom of the ſea, to increaſe under their feet; and they brought with them the pumice ſtone and oyſters, which the rock ſtill had attached to its ſurface. There was a ſlight earthquake at Santorini, two days before the growth of this ſhoal. This new iſland increaſed conſiderably till the 14th of June, without any accident, and was then half a mile round, and from twenty to thirty feet high. The earth was white, and bordered a little on argillaceous, after which the ſea was ſtill more agitated; vapours aroſe, which infected the iſland Santorini; and, the 16th, 17th, or 18th of July, rocks were ſeen to iſſue at one time from the bottom of the ſea; all of which ſeemed to unite into one rock. All this was done with a diſmal noiſe, which continued upwards of two months, with flames that roſe from the new iſland, which ſtill kept itſelf increaſing in circumference and height; and the exploſions always threw out rocks and ſtones to the diſtance of ſeven miles.

The 10th of October, 1720, near the iſland Tercera, a very conſiderable fire aroſe out of the ſea. Mariners having been ſent to examine it, they perceived, the 19th of the ſame month, an iſland which appeared to be covered with fire and ſmoke, and a prodigious quantity of cinders thrown to a diſtance, as from a volcano, and accompanied with a noiſe ſimilar to that of thunder.

The hiſtorian of the French Academy in relating this event, remarks, that, after an earthquake in the iſland of St Michael, a torrent of fire appeared between it and the iſland Tercera, which gave birth to two new rocks. And, next year, the ſame hiſtorian gives the following account:

" M. de l'Iſle has informed the Academy of ſeveral particulars,
" which were communicated to him in a letter, from M. de Montagnac,
" conſul at Liſbon, concerning the new iſland among the Azores.
" On the 18th of September, 1721, M. de Montagnac's veſſel was
" moored off the Fortreſs of St Michael; and he procured from the
" Pilot of the port the following intelligence.

" On the 7th of December, 1720, at night, a great earthquake
" happened in Tercera and St Michael, which are diſtant about 28
" leagues from one another, and a new iſland emerged from the ſea.
" It was, at the ſame time, obſerved that the iſland Peak, thirty leagues
" diſtant, which ejected flames, was extinguiſhed. But a continual
" thick ſmoke proceeded from the new iſland, which was diſtinctly perceived
" by M. de Montagnac, as long as he ſtaid in that part. The
" pilot aſſured him, that he had ſailed round the iſland, and approached
" it as near as he could with ſafety. He ſounded on the ſouth ſide
" of it with a rope of 60 fathoms; but found no bottom. On the weſt
" ſide, the water appeared to be mixed with white, blue and green;
" and at the diſtance of two miles, it ſeemed to be ſhallow and boiling.
" On the north-weſt, the ſide from which the ſmoke iſſued, he found,
" at 15 fathoms, a bottom of coarſe ſand. He threw a ſtone into the
" ſea, and at the place where it fell, he obſerved the water boil and

" mount into the air with great velocity. The bottom was ſo hot as " to melt a piece of ſuet that had been faſtened to the end of the " plumb line. The pilot alſo obſerved ſmoke to iſſue from a ſmall lake, " in the midſt of a ſandy plain.

" We have ſince learned from M. Adrien, the French conſul at St " Michael, dated, March 1722, that the new iſland is near on a level " with the water; and that it will probably ſoon diſappear.

" From theſe and ſeveral other ſimilar facts, it appears, that inflammable bodies exiſt under the bottom of the ſea, and that they " ſometimes produce violent exploſions.

On the whole, however, the iſlands produced by the action of fire and earthquakes, are but few, and theſe events are ſeldom; but there are an infinite number of new iſlands produced by the mud, ſand and earth, which the rivers, or the ſea carry and tranſport into different places. At the mouth of all rivers, maſſes of earth and banks of ſand are formed, whoſe extent often become conſiderable enough to form iſlands of a moderate ſize. The ſea retiring from certain coaſts, leaves the parts higheſt from the bottom naked, which form ſo many new iſlands. And likewiſe, by extending itſelf on certain ſhores, it covers the loweſt parts, and leaves the higheſt, which it could not ſurmount, to appear above the ſurface of the water, which form ſo many more iſlands. In conſequence of which, it is remarked, that there are very few iſlands in the middle of the ſea, and that they are almoſt all in the neighbourhood of the continents, where the ſea formed them, either by retreating from, or approaching towards, theſe different countries.

Water and fire, whoſe natures are different, and even contrary, produce what, at leaſt appears to us to be ſimilar effects. Water, as has been obſerved, has produced mountains, and formed moſt iſlands. There are likewiſe caverns, clefts, holes, gulphs, &c. ſome of which owe their origin to ſubterranean fires, and others to water.

Saint Patrick's cavern, in Ireland, is not ſo conſiderable as it is famous. It is the ſame with the Dog's Grotto in Italy, and with that which throws out fire in the mountain of Benigauzeval, in the kingdom of Fez.

One of the moſt remarkable and largeſt caverns known, is that of Antiparos, which is computed to be three hundred fathoms deep from the ſurface of the earth; but the grotto appears to be forty fathoms high by fifty broad. It is filled with large, beautiful ſtalactites, of various forms, both on the root of the vault and at the bottom.

In that part of Greece, called Livadia, (the Achaia of the ancients) there is a large cavern, in a mountain which was formerly very famous for the oracles of Trophonius, between the lake Livadia and the adjacent ſea. There are forty ſubterranean paſſages acroſs the rock, under a lofty mountain, through which the waters of the lake continually flow.

In the month of June, 1714, a part of the mountain of Diableret in Valois, fell ſuddenly, between two and three o'clock in the afternoon. The ſky was very ſerene; the mountain was of a conical figure, and deſtroyed fifty-three huts belonging to the boors, and cruſhed to death fifteen people, and above two hundred cattle, and covered a ſquare league with its ruins. A profound darkneſs was occaſioned by the duſt. The heaps of ſtones thrown together ſtopped the current of the water, which formed new and very deep lakes. In all of which, however, there was not the leaſt trace of bituminous matter, ſulphur, lime, nor conſequently any ſubterranean fire, and it appeared that the baſe of this great rock was worn away, or reduced to duſt*.

We have a remarkable example of theſe ſinkings near Folkſtone, in the county of Kent. The hills in its environs have ſunk gradually, by an imperceptible motion, and without any earthquake. Theſe hills internally are rocks of ſtone and chalk. By this ſinking, they have thrown into the ſea rocks and earths which are adjacent to it.

When the waters on the ſurface of the earth cannot find vent to flow, they form moraſſes and bogs. The moſt famous moraſſes in Europe, are thoſe of Muſcovy at the ſource of Tanais; thoſe of Finland, where are the great moraſſes of Savolax and Enaſak. There are alſo ſome in Holland, Weſtphalia, and many other low countries. In Aſia, the moraſſes of the Euphrates, thoſe of Tartary, and the Palus Meotidis; nevertheleſs, in general, there are fewer of them in Aſia and Africa than in Europe. But America may be ſaid to be but one continued moraſs, through all its plains. This great number of moraſſes is a proof of the modern date of the country, and of the ſmall number of inhabitants, and ſtill more of their want of induſtry.

To give an idea of the quantity of earth which the rain detaches from the mountains and carries along with it into the valleys, we can quote a circumſtance related by Dr Plot. In his Natural Hiſtory of Staffordſhire, he obſerves that, eighteen feet deep in the earth ſeveral pieces of money coined in the reign of Edward V. have been found; i. e. two hundred years before his time. Hence this ground, which is boggy, has increaſed above a foot in eleven years, or an inch and a twelfth every year. We can ſtill make a ſimilar obſervation on trees buried at ſeventeen feet depth, below which medals of Julius Cæſar have been found. Thus the earth brought from the tops of mountains into plains by running waters, fail not to increaſe the elevation of the ground of plains very conſiderably.

In the city of Modena, and four miles round, whatever part is dug, when we reach the depth of ſixty-three feet, and bore five feet deeper with an auger, the water ſprings out with ſuch force, that the well is filled in a very ſhort ſpace of time. This water flows continually, and neither diminiſhes nor increaſes by the rain or drought. What is remarkable in this ground, is, that when we reach the depth of fourteen feet, we find pavements, and other ruins of an ancient town, as boards, houſes, different pieces of moſaic work, &c. Below theſe we find a very ſolid ground, which is thought to have never been ſtirred; yet below it we find a moiſt earth mixed with vegetables. And at twenty-ſix feet, are entire trees, as nut-trees, with nuts on them, and a great quantity of branches and leaves of trees. At twenty-eight feet depth, we meet with a friable chalk, mixed with many ſhells; and this bed is eleven feet in thickneſs; after which, we again meet with vegetables, and ſo on alternately chalk and earth mixed with vegetables, to the depth of ſixty-three feet. At which depth is a bed of ſand mixed with ſome gravel and ſhell, like thoſe formed on the coaſts of the Italian ſea. Theſe ſucceſſive beds of fenny or marſhy earth and chalk, are always found in the ſame order, wherever we dig; and very often the auger meets with large trunks of trees, which it bores through, but which give great trouble to the workmen; bones, coals, flint and pieces of iron are alſo found. Ramazzini, who relates theſe circumſtances, thinks that the gulph of Venice formerly extended beyond Modena; and that perhaps by the inundations of the ſea, this ground has been formed.

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* Hiſtoire de l' Academie des Sciences, anno 1715, p. 4.

It is evident, that conſiderable changes have taken place on the ſurface of the globe not only by the action of fire, but alſo by water. The ſea, from various circumſtances, has repeatedly changed its bed. Authors have ſuſpected, that the iſland of Great Britain was formerly united to the continent of France. On the coaſt of France, England, Holland and Germany, the ſea has retreated in many parts. In Italy, a conſiderable tract of territory has been gained by the retreating of the ocean; and Ravenna, which was formerly a ſea-port of the Exarques, is no longer a maritime town.

On the mountain of Stella, in Portugal, is a lake in which the wrecks of ſhips have been found, notwithſtanding this mountain is more than twelve leagues diſtant from any ſea. Sabinus, in his commentaries on Ovid's Metamorphoſes, ſays, that from the monuments of hiſtory it appears, that in the year 1460, a whole ſhip, with its anchors, was found in a mine of the Alps.

CHAP. V.

ANALOGIES BETWEEN ANIMALS AND VEGETABLES—ON THE NATURE OF MAN—OF INFANCY—MANHOOD—EXTENT OF HUMAN LIFE—OF THE SENSES—ANECDOTES ILLUSTRATIVE OF THIS SUBJECT.

AMONG the vaſt variety of objects in which the ſurface of this globe abounds, animals hold the firſt rank, both on account of the relation which they bear to man, and of their ſuperiority over vegetable and inanimated nature. The ſenſes, the figure, and the motions of animals, afford them a more intimate connection with ſurrounding objects than vegetables poſſeſs. The latter, however, from their expanſion, their growth, and the variety of ports which compoſe them, are more intimately related to external objects than minerals or ſtones, which are perfectly inert, and deſtitute of every vital principle. It is this number of relations alone which renders the animal ſuperior to the vegetable, and the vegetable to the mineral.

What a variety of ſprings, of powers, and of mechanical movements, are included in that ſmall portion of matter of which the body of an animal is compoſed! What a number of relations, what harmony, what correſpondence among the different parts! How many combinations, arrangements, cauſes, effects, and principles all conſpiring to accompliſh the ſame grand deſign!

But how admirable ſoever this work may appear, the greateſt miracle is not exhibited in the individual. It is in the ſucceſſive renovation, and in the continued duration of the ſpecies, that nature aſſumes an aſpect inconceivable and aſtoniſhing. This faculty of reproduction, which is peculiar to animals and vegetables, muſt, with regard to us, continue to be ſo profound a myſtery, that we ſhall probably never be able to inveſtigate it with ſufficient accuracy.

Even inanimated bodies have ſome properties, and the moſt imperfectly organized matter poſſeſſes many relations with the other parts of the univerſe. We will not aſſert, however, that matter under whatever form it appears, is conſcious of its exiſtence, and of its relative powers. We ſhall only ſay, that being ignorant of the extent of our own connections with external objects, we will not heſitate to pronounce inanimated matter to be infinitely more ſo. Beſides, as our ſenſations have not the moſt diſtant reſemblance to the cauſes that produce them, analogy obliges us to conclude that dead matter is neither endowed with ſentiment, ſenſation, nor even with a conſciouſneſs of its own exiſtence.

With inanimated matter, therefore, we have no other relations than what ariſe from, the general properties of bodies, extenſion, impenetrability, gravity, &c. But, as relations purely material make no impreſſion on us, and as they exiſt entirely independant of us, they cannot be conſidered as any part of our being. Our exiſtence, therefore, is an effect of organization, of life, of the ſoul. Matter, in this view, is not a principal but an acceſſary. It is a foreign covering united to us in a manner unknown. But in order to give a more perfect idea of the nature of man, let us trace him through the different ſtages of his exiſtence.

At its birth, the infant is expoſed to a new element, the air. What the ſenſations are on the admiſſion of this element into the lungs, it is impoſſible to conjecture; but, from the cries of the infant, we have reaſon to believe that it is attended with pain. The eyes of an infant are indeed open, but they are dull, and appear to be unfitted for the performance of any office whatever; and the outward coat of them is wrinkled. The ſame reaſoning will apply to moſt of the other ſenſes. It is not till after forty days that it begins to ſmile; nor is it till then that it begins to weep. Its former ſenſations of pain are unaccompanied with tears. The ſize of an infant born at the full time, is twenty-one inches, though ſome do not exceed fourteen; and it generally weighs twelve, and ſometimes fourteen pounds. The form of the body and members of a new-born infant are by no means perfect. At the end of three days, there generally appears a kind of jaundice; and at that time, there is generally milk in the breaſt of the infant, which is ſqueezed out with the fingers. The ſkull of infants is not compleatly formed. In the language of the nurſery, the head is open in a particular part; that is, the ſkull bones have not yet grown far enough to meet. In this opening, a palpitation may ſometimes be diſcovered; and the beating of the arteries may always be felt. Above this opening, a ſpecies of ſcurf appears, which is rubbed off with a bruſh. In this country, infants, as ſoon as born, are injudiciouſly and unnaturally laced with bandages, which renders them unable to move a ſingle joint. Nations which we call barbarous, act more rationally in this reſpect. The Siameſe, the Indians, the Japaneſe, the Negroes, the Savages of Canada, of Virginia, of Braſil, and almoſt all the inhabitants

habitants of South America, lay their infants naked in hanging beds of cotton, or in cradles lined with fur.

Infants ſleep much, but their ſleep is often interrupted. They ought to have the breaſt every two hours in the day, and in the night as often as they awake. It is of great importance to keep children clean and dry from their excrements. The American Indians, who cannot change their furs as frequently as we can do our clothes, put under them the duſt of rotten wood, and renew it as often as it gets damp. Great evils enſue from the negligence of nurſes. Infants are ſometimes left to cry for a conſiderable time, which often occaſions diſeaſes, or, at leaſt, throws them into a ſtate of laſſitude, which deranges their conſtitutions. To palliate this they are ſometimes put into a cradle and rocked to ſleep, which may occaſionally derange the ſtomach and head. Before children are put up into the cradle, we ought to be certain they want nothing, and when they are rocked, it ought never to be with ſuch violence as to ſtun or ſtupify them. The eyes of children are always directed towards the light, and if one eye only be directed to it, the other will probably become weak; both eyes ought, therefore, to be equally ſhaded, or equally expoſed. Squinting is commonly the effect of injudicious treatment in this reſpect. For the firſt two or three months the diet of the infant ought chiefly to be confined to its mother's milk.

The eight inciſores, or fore-teeth, appear firſt. They are produced generally by pairs, and from two months old to ten or twelve. The four canini (or dog-teeth) appear commonly about the 9th or 10th month. About the cloſe of the firſt, or in the courſe of the ſecond year, 16 other teeth appear, called *molares*, or grinders. In the 5th, 6th, or 7th year the fore-teeth, and the dog-teeth, and the firſt ſix of the grinders, naturally ſhed, and a new ſet appears. At the age of puberty, or later, the *dentes ſapientiæ*, or wiſe teeth, appear. Women are ſaid to have fewer teeth than men.

The hair of moſt infants is exceedingly light, almoſt white. When a child is ſuffered to cry violently, and too long, it is in danger of a rupture, but the early application of bandages or truſſes will frequently remove the complaint.

The frame of infants is leſs ſenſible of cold than during any other ſeaſon of life. The pulſe is ſtrong, and it is therefore fair to conclude, that the internal heat is conſiderable. Small animals for the ſame reaſon have more heat than great ones; becauſe the action of the heart and arteries increaſes in proportion to the comparative ſmallneſs of the animal. Till the age of three years the life of infants is extremely precarious; in the courſe of the enſuing ſecond and third years it becomes more certain, and at ſix or ſeven a child has greater probability of living than at any other period of life. It is remarked that of a certain number of children born at the ſame time, above a fourth die in the firſt year; above a third in two years, and at leaſt one half in three years. By other calculations, it appears that one half of the children born at the ſame time, are not extinct in leſs than ſeven or eight years.

At 12 or 15 months infants begin to liſp. A is the vowel which they pronounce with moſt eaſe. Of the conſonants B, M, P, T, are moſt eaſy. In every language, therefore, *Baba*, *Mama*, *Papa*, are the firſt words that children learn. Some children pronounce diſtinctly in two years, though the generality do not ſpeak for two years and a half, and frequently not ſo ſoon.

Some young perſons ceaſe growing at 14 or 15, while others continue their growth to 22 or 23. In men the body attains its perfect proportion at the age of 30, and in women ſooner. The perſons indeed of women are generally complete at 20. The diſtance between the eyes is leſs in man than in any other animal; in ſome creatures, in fact, the eyes are at ſo great a diſtance, that it is impoſſible they ſhould ever view the ſame object with both eyes at once. Men and apes are the only animals that have eye-laſhes on the lower eye-lid. Other animals have them only on the upper one. The upper eye-lid riſes and falls, the lower has ſcarcely any motion.

The ancients erroneouſly conſidered the hair as a kind of excrement, and believed that, like the nails, it increaſed by the lower part puſhing out the extremity. But the moderns have diſcovered that every hair is a tube, which fills and receives nutriment like the other parts of the body. The roots, they obſerve, do not turn grey ſooner than the extremities, but the whole changes its colour at once. We have known perſons the hair of whoſe heads have become grey in one night.

There is no part of the body which has been ſubject to ſuch changes of faſhion as the hair and the beard. Some people, and among others the Turks, cut the hair off their heads, and let their beards grow. The Europeans, on the contrary, ſhave their beards, and wear their hair. The negroes ſhave their heads in figures at one time, in ſtars at another, in the manner of friars; and ſtill more commonly in alternate ſtripes; and their little boys are ſhaved in the ſame manner. The Talapoins, of Siam, ſhave the heads and the eye-brows of ſuch children as are committed to their care. Every nation ſeems to have entertained different prejudices, at different times, in favour of one part or another of the beard.

The neck ſupports the head, and unites it to the body. This part is much more conſiderable in the greater number of quadrupeds, than in man. But fiſhes, and other animals that have not lungs ſimilar to ours, have no neck whatever. Birds, in general, have the neck longer than any other kind of animal. Thoſe which have ſhort claws, have alſo ſhort necks; thoſe, on the contrary, that have them long, are found to have the neck in proportion.

The human breaſt is outwardly formed in a very different manner from that of other animals. It is larger in proportion to the ſize of the body; and none but man, and ſuch animals as make uſe of their fore feet as hands, ſuch as monkeys, bats, and ſquirrels, are found to have thoſe bones called clavicles, or, as we uſually term them, collar-bones. The breaſts in women are larger than in men; however, they ſeem formed in the ſame manner; and, ſometimes, milk is found in the breaſts of men, as well as in thoſe of women. Birds, and all other oviparous animals, have no teats; but viviparous fiſhes, as the whale and the dolphin, have both teats and milk.

There is little known exactly with regard to the proportion of the human figure; and the beauty of the beſt ſtatues is better conceived by obſervation than by meaſurement. Some who have ſtudied after the ancient maſters, divide the body into ten times the length of the face, and others into eight. They tell us, that there is a ſimilitude of proportion in different parts of the body: thus, that the hand is the length of the face; that the thumb is the length of the noſe; that the ſpace between the eyes is the breadth of the eye; that the breadth of the thickeſt part of the thigh is double that of the thickeſt part of the leg, and treble the thinneſt, &c.

The ſtrength of man is very conſiderable when matured by practice. We are aſſured, that the porters of Conſtantinople carry burthens nine hundred pounds weight. And M. Deſaguliers mentions a man in an upright poſture, who, by diſtributing a certain number of weights, in ſuch a manner that every part of his body bore its ſhare, was able to ſupport a weight of two thouſand pounds.

The ſtrength of a man may be ſtill farther eſtimated by the continuance of his labour, and by the agility of his motions. Men, who are exerciſed in running, outſtrip horſes, or at leaſt continue their ſpeed for a greater length of time. In a journey, after a man and a horſe have proceeded together for ſeveral days, the former will be freſh when the latter will be quite tired. The royal meſſengers of Iſpahan run thirty-ſix leagues in fourteen or fifteen hours. Travellers aſſure us, that the Hottentots out-run lions in the chace; and that the ſavages who hunt the elk, purſue this animal, which is as fleet as a ſtag, with ſuch ſpeed that they take it. The civilized man is ignorant of his own ſtrength, nor is he ſenſible how much he loſes of it by effeminacy, and how he might add to it by the habit of vigorous exerciſe.

To complete our deſcription of man, it will be proper to inveſtigate the human countenance, as it appears among ourſelves, when agitated by the paſſions. In affliction, in joy, in love, in ſhame, in compaſſion, the eyes are apt to be ſwelled, and as it were obſcured by an overflow of tears. The effuſion of theſe is always accompanied with a tenſion of the muſcles of the viſage, by which there is occaſioned an opening of the mouth. At the ſame time, the natural moiſture in the noſe becomes more copious, and, by internal paſſages, mixes itſelf with the lachrymal moiſture; which, however, flows only at intervals, not always.

The two corners of the mouth are lowered, by grief, the under lip is erected, the eye-lid is half cloſed, the pupil of the eye is raiſed, and almoſt covered with the eye-lid. And the other muſcles of the face are ſo much relaxed, that the ſpace between the mouth and the eyes is larger than ordinary, and conſequently the countenance aſſumes a lengthened appearance.

Fear, terror, or horror, wrinkles the forehead, raiſes the eye-brow, extends the eye-lids as much as poſſible, and diſcovers a part of the white of the eye over the pupil, which is lowered, and ſomewhat concealed by the inferior eye lid. The mouth, at the ſame time, is widely opened, and the lips being ſeparated, both the upper and under teeth appear.

Contempt or deriſion, raiſe the upper lip on one ſide, and on the other there is a little motion, as if in order to ſmile. The noſe is ſhrivelled on the ſame ſide on which the lip is raiſed, and the corner of the mouth is extended. The eye on the ſame ſide is almoſt ſhut, while the other is open as uſual, but the pupil of each is lowered, as when one looks downward.

By jealouſy, malice, and envy, the eye-brow falls down, and is knit, the eye-lid is raiſed, and the pupil lowered. The under-lip is raiſed on each ſide, while the corners of the mouth are rather lowered, and the middle of the under-lip is raiſed, in order to join the middle of the upper one.

The two corners of the mouth are extended by laughter, and ſomewhat raiſed. The upper part of the cheeks is raiſed, and the eyes are more or leſs cloſed. The upper lip too is raiſed, while the under one is lowered; and, in moderate laughter, the mouth is opened, and the ſkin of the noſe is contracted. Where there is a good natural conſtitution of the body, it is not impoſſible, by moderating the paſſions, temperance and ſobriety, to extend the period of life for a few years. But even of this there ſeems to be an uncertainty; for, if it is neceſſary that the body ſhould employ its whole ſtrength, that it ſhould conſume whatever it is capable of conſuming, that it ſhould undergo every poſſible exerciſe, whence could any benifit accrue from regimen, and from abſtinence? Men no doubt there are who have outlived the uſual period of human exiſtence. Not to mention Par, who lived to the age of one hundred and forty-four, and Jenkins, to that of one hundred and ſixty-five, as recorded in the Philoſophical Tranſactions; we have many inſtances of the prolongation of life to one hundred and ten, and even to one hundred and twenty years. Yet this longevity was owing to no peculiar art or management. On the contrary, it appears, that the greater number of ſuch long livers were peaſants accuſtomed to the greateſt fatigues, huntſmen, or labourers; men, in fact, who had employed their whole bodily ſtrength, and even abuſed it, if it be poſſible to abuſe it by any thing but by continual idleneſs and debauchery.

If in the duration of life there is any difference to be found, it ſeems proper to aſcribe it to the quality of the air. In elevated ſituations, old people are more generally found than in low ones. In the mountains of Scotland and Wales, Auvergne and Switzerland, there have been more inſtances of extreme longevity than in the plains of Holland or Flanders, of Germany or Poland. Human life is however nearly the ſame in every country. Accidental diſtreſs excepted, the common verge of exiſtence is ninety or an hundred years, which has been the caſe ſince the days of David, without much variation.

The following table of the probabilities of human life, has been compiled from a careful examination of many country regiſters of burials in France, compared with the mortality bills of Paris.

TABLE

OF THE PROBABILITIES OF THE DURATION OF LIFE.

Age.	Duration of Life.		Age.	Duration of Life.		Age.	Duration of Life.	
Years	Years	Months	Years	Years	Months	Years	Years	Months
0	8	0	29	28	6	58	12	3
1	33	0	30	28	0	59	11	8
2	38	0	31	27	6	60	11	1
3	40	0	32	26	11	61	10	6
4	41	0	33	26	3	62	10	0
5	41	6	34	25	7	63	9	6
6	42	0	35	25	0	64	9	0
7	42	3	36	24	5	65	8	6
8	41	6	37	23	10	66	8	0
9	40	10	38	23	3	67	7	6
10	40	2	39	22	8	68	7	0
11	39	6	40	22	1	69	6	7
12	38	9	41	21	6	70	6	2
13	38	1	42	20	11	71	5	8
14	37	5	43	20	4	72	5	4
15	36	9	44	19	9	73	5	0
16	36	0	45	19	3	74	4	9
17	35	4	46	18	9	75	4	6
18	34	8	47	18	2	76	4	3
19	34	0	48	17	8	77	4	1
20	33	5	49	17	2	78	3	11
21	32	11	50	16	7	79	3	9
22	32	4	51	16	0	80	3	7
23	31	10	52	15	6	81	3	5
24	31	3	53	15	0	82	3	3
25	30	9	54	14	6	83	3	2
26	30	2	55	14	0	84	3	1
27	29	7	56	13	5	85	3	0
28	29	0	57	12	10			

By this Table it appears, that we may lay our bett one to one, that an infant newly born will live eight years; that an infant of one year will live thirty-three years longer; that an infant of two years will live thirty-eight years longer; that a man of twenty will live thirty-three years and five months longer; that a man of thirty will live twenty-eight years longer; and ſo proportionally of every other age.

Ideas of external things are conveyed to the ſoul of man by means of the five ſenſes, *ſeeing*, *hearing*, *feeling*, *taſting*, and *ſmelling*. The organs by which the ſenſes act are the nerves, which are ſmall thread-like fibres diſtributed over the whole body, and all of them connected with the brain.

The eyes ſeem to be formed very early in the human embryo. In the chicken alſo, of all the parts that are double, they are the ſooneſt produced; and I have obſerved upon the eggs of ſeveral ſorts of birds, as well as upon thoſe of lizards, that the eyes were much larger and earlier in their expanſion, than any other parts of two-fold growth. Though in viviparous animals, and particularly in man, they are, at firſt, by no means ſo large in proportion as in the oviparous claſſes, yet they obtain their due formation ſooner than any other parts of the body. This is alſo the caſe with the organ of hearing. The little bones that aſſiſt in conſtructing the internal parts of the ear, are entirely formed before any of the other bones have acquired any part of their growth or ſolidity. Hence it is evident, that the parts of the body, which are furniſhed with the greateſt quantity of nerves are thoſe which appear firſt, and which firſt attain to perfection.

Mr Cheſelden, having couched for a cataract a lad of thirteen years of age, who had from his birth been blind, and thus communicated to him the ſenſe of ſeeing, was at great pains to mark the progreſs of his viſual powers. This youth, though hitherto incapable of ſeeing, was not, however, abſolutely and entirely blind. Like every other perſon, whoſe viſion is obſtructed by a cataract, he could diſtinguiſh day from night, and even black from white, or either from the vivid colour of ſcarlet. Of the form of bodies, however, he could diſtinguiſh nothing, nor of colours themſelves, unleſs the light was ſtrong. At firſt the operation was performed only upon one of his eyes; and when he ſaw for the firſt time, he was ſo far from forming the leaſt conception of diſtances, that he ſuppoſed (as he himſelf expreſſed it) every thing he ſaw touched his eyes, in the ſame manner as every thing he felt touched his ſkin. The objects that pleaſed him moſt were thoſe of which the ſurfaces were plain, and the figures regular; though he could neither judge of their different forms, nor give any reaſon why he preferred ſome to others. The ideas he had entertained of colours, during his former dark ſtate, were ſo imperfect that, when he ſaw them in reality, he could hardly be perſuaded they were the ſame. When ſuch objects were ſhewn him as he had been formerly familiar with, by the touch, he beheld them with earneſtneſs, in order to diſtinguiſh them a ſecond time. As of theſe, however, he had too many to retain at once, the greateſt number were forgot; and for one thing which he recollected upon ſeeing a ſecond time, there were a thouſand of which he had not the leaſt remembrance. He was very much ſurpriſed to find that thoſe perſons, and thoſe objects, which he had loved beſt, were not the moſt pleaſing to the eye. Nor could he help expreſſing his diſappointment in finding his parents leſs handſome than he had conceived them to be. Before he could diſtinguiſh that a picture reſembled a ſolid body, above two months elapſed. Till then, he only conſidered it as a ſurface diverſified by a variety of colours: but, when he began to perceive that theſe ſhadings actually repreſented human beings, he alſo began to examine, by the touch, whether they had not the uſual qualities of ſuch bodies; and great was his ſurpriſe to find what he had imagined a very unequal ſurface, to be ſmooth and even. He was then ſhewn a miniature-portrait of his father, which was contained in his mother's watch-caſe; and though he readily perceived the reſemblance, yet he expreſſed his aſtoniſhment, how ſo large a face could be compriſed in ſo ſmall a compaſs. To him it appeared as ſtrange as that a pint-veſſel ſhould contain a buſhel. At firſt, he could bear but a very ſmall quantity of light, and he ſaw every object much greater than the life. But in proportion as he obſerved objects that were really large, he conceived the others to be diminiſhed. Beyond the limits of what he ſaw, he had no conception of any thing. Although he knew that the apartment he occupied was only a part of the houſe, he could not conceive how the latter ſhould ſeem larger than the former. Before the operation he had no great expectation of the pleaſure he ſhould receive from the new ſenſe he was promiſed. That by it he might be enabled to read and write, was his grand object. He ſaid, that he could enjoy no greater ſatisfaction from walking in the garden, with this ſenſe, than without it; becauſe there he already walked at his eaſe, and knew all the walks. With great truth he alſo obſerved, that his blindneſs gave him one advantage over the reſt of mankind; an advantage which indeed he retained long after he had acquired the ſenſe of ſeeing; namely, that of being able to walk in the dark with confidence and ſecurity. He no ſooner, however, had begun to enjoy this new ſenſe, than he was tranſported beyond meaſure; and he declared that every new object opened to him a freſh ſource of delight. About a year after, he was carried to Epſom, where there is a beautiful, and an extenſive proſpect. With this he ſeemed greatly charmed; and the landſcape before him he called a new method of ſeeing. He was couched in the other eye, a year after, and of both operations the ſucceſs was equal. When he ſaw with both eyes every thing appeared to him twice as big as when he ſaw but with one, although he did not ſee double, or at leaſt he diſcovered no marks from which any ſuch concluſion could be inferred.

Diſtance is only conceived by experience, for the more diſtant an object is, the leſs it appears. When, from certain circumſtances, we cannot form a juſt conception of diſtance, and when we cannot judge of objects but by the angle, or rather by the image, which they have in our eyes, we are then neceſſarily deceived as to their ſize. Every man has felt how liable we are in travelling by night to miſtake a buſh which is near for a tree at a diſtance, or indeed a diſtant tree for a buſh at hand. In the ſame manner, if we do not diſtinguiſh objects by their ſhape, and if we cannot by it judge of diſtance, the ſame fallacy will ſtill continue. In this caſe, a fly, which may paſs before us with rapidity, will ſeem to be a bird at a conſiderable diſtance; and a horſe which may be in the middle of a plain, not moving, and in an attitude ſimilar, for inſtance, to that of a ſheep, will ſeem to be no bigger than a ſheep, till we have found out that it is a horſe.

If, therefore, we are benighted in a ſtrange place, where no judgment can be formed of diſtance, we are every moment liable to deceptions of viſion. Hence originate the dreadful ſtories of ſpectres, and of thoſe wonderful, hideous, and gigantic figures, which ſo many perſons ſpeak of having ſeen. Though ſuch figures it is commonly aſſerted, exiſt ſolely in the imagination, yet it is highly probable, that they might appear to the eye, in every different reſpect deſcribed to us. This remark will be allowed to be the more probable, when we conſider, that whenever we cannot-judge of an object but by the angle which it forms in the eye, this object is magnified according to its propinquity. And that, if it ſeemed at firſt to the ſpectator who is equally incapable of diſtinguiſhing what he ſees, and of judging at what diſtance he ſees it, when at the diſtance of twenty or thirty paces from it, a few feet high, it muſt look to him, when within a few feet of it, of a ſize ſtupendouſly increaſed. At this he muſt naturally be terrified, till he touches and diſtinguiſhes the ſeemingly gigantic object, for in the very inſtant that he has an actual perception of what it is, the object will diminiſh, and appear to him what it really is. If, on the other hand, he is afraid to approach it, and he flies from the ſpot with precipitation, the only idea he will form of what had preſented itſelf to him, will be that of an image, gigantic in its ſize, and dreadful in its form. This prejudice about ſpectres, therefore, originates from nature; and ſuch viſions depend not, as philoſophers have ſuppoſed, upon the imagination only.

We have ſeveral reaſons for ſuppoſing that ſuch perſons as are ſhort-ſighted ſee objects larger than others; and yet it is a certain fact that they ſee them leſs.

Deception is not however confined to one ſenſe; ſo that hearing is liable to ſimilar miſtakes with ſight. By this ſenſe no diſtinct intelligence is conveyed of the diſtance whence a ſounding body is heard. A great noiſe if diſtant, and a ſmall one very near, produce the ſame feeling; and, unleſs we receive information from ſome other ſenſe, we can never tell accurately whether the ſound be great or ſmall. It is not till we have by experience, become acquainted with any particular ſound, that we can judge of the diſtance whence we hear it. When, for example, we know the tone of a bell, we are then at no great loſs to determine how far it is from us.

Every body that ſtrikes againſt another produces a ſound, which is ſimple in ſuch bodies as are not elaſtic, but which is often repeated in ſuch as are. If we ſtrike a bell, for inſtance, a ſingle blow produces a ſound, which is repeated by the undulations of the ſonorous body, and which is multiplied as often as it happens to undulate or vibrate. Theſe undulations ſucceed each other ſo faſt, that the ear ſuppoſes them one continued ſound; whereas they form many ſounds. Sounding bodies are therefore of two kinds, to wit, non-elaſtic and elaſtic. The former when ſtruck return but a ſingle ſound, and the latter return a ſucceſſion of ſounds which form a tone. This tone may be conſidered as a great number of ſounds, all produced one after the other, by the ſame body, as we find in a bell which continues to ſound for ſome time after it is ſtruck. A continuing tone may alſo be produced from a non-elaſtic body, by repeating the blow quick and often, as when we beat a drum, or when we draw a bow along the ſtring of a fiddle.

To know the manner in which muſical ſounds become pleaſing, it muſt be obſerved, no one continuing tone, how loud or ſwelling ſoever, can afford us delight. We muſt have a ſucceſſion of them, and thoſe in the moſt pleaſing proportion. The nature of this proportion may be thus conceived. If we ſtrike a body incapable of vibration with a double force, or, what amounts to the ſame thing, with a double maſs of matter, it will produce a ſound that will be double grave. Muſic has been ſaid, by the ancients, to have been firſt invented from the blows of different hammers on an anvil. Suppoſe then we ſtrike an anvil with an hammer of one pound weight, and again with an hammer of two pounds, it is plain that the two pound hammer will produce a ſound twice as grave as the former. But if we ſtrike with a two pound hammer, and then with a three pound, it is evident that the latter will produce a ſound one third more grave than the former. If we ſtrike the anvil with a three pound hammer, and then with a four pound, it will likewiſe follow that the latter will be a quarter part more grave than the former. Now, in comparing between all thoſe ſounds, it is obvious that the difference between one and two is more eaſily perceived than that between two and three, three and four, or any number ſucceeding in the ſame proportion. The ſucceſſion of ſounds will therefore, pleaſe in proportion to the eaſe with which they may be diſtinguiſhed. That ſound which is double the former, or, the octave to the preceding tone, will be the moſt pleaſing. The next to that, which is as two to three, or, the third, will be moſt agreeable. And thus univerſally, thoſe ſounds whoſe differences may be moſt eaſily compared are the moſt agreeable.

Sound has in common with light, the property of being extenſively diffuſed. Like light, it alſo admits reflection. The laws of this reflection, it is true, are leſs diſtinctly underſtood than thoſe of light. All we know is, that ſound is principally reflected by hard bodies, and that their being hollow alſo ſomtimes increaſes the reverberation. The internal cavity of the ear, which is faſhioned out in the temporal bone, like a cavern cut into a rock, ſeems to be fitted for the purpoſes of echoing ſound with the greateſt preciſion.

One of the moſt common complaints in old age is deafneſs; which probably proceeds from the rigidity of the nerves in the labyrinth of the ear. This diſorder alſo proceeds ſometimes from a ſtoppage of the wax, which art may eaſily remedy. In order to know whether the defect be an internal or an external one, let the deaf perſon put a repeating-watch into his mouth; and if he hears it ſtrike, he may be aſſured that his diſorder proceeds from an external cauſe.

It often happens, that people hear better with the one ear than with the other; but theſe have, what muſicians call, a bad ear. I have made ſeveral experiments on perſons of this deſcription; and I have uniformly found, that their defect in judging properly of ſounds proceeds from the inequality of their ears, and from their receiving by both at the ſame time, unequal ſenſations. In like manner, as ſuch perſons hear falſe, they alſo, without knowing it, ſing falſe. They alſo frequently deceive themſelves with regard to the ſide whence the ſound comes, generally ſuppoſing the noiſe to come on the part of the beſt ear.

Hearing is a much more neceſſary ſenſe to man than to animals. In theſe it is only a warning againſt danger, or an encouragement to mutual aſſiſtance. In man, it is the ſource of moſt of his pleaſures; and without it the reſt of his ſenſes would be of little benefit. A man born deaf, muſt neceſſarily be dumb; and his whole ſphere of knowledge muſt be bounded by ſenſual objects. We have a ſingular inſtance of a young man, who, being born deaf, was reſtored, at the age of twenty-four, to perfect hearing. The account which is given in the memoirs of the Academy of Sciences, 1703, page 18, is as follows:

" A young man, of the town of Chartres, between the age of twenty-three and twenty-four, the ſon of a tradeſman, and deaf and dumb from his birth, began to ſpeak all of a ſudden, to the utter aſtoniſhment of the whole town. He gave them to underſtand that, about three or four months before, he had heard the ſound of the bells, and was greatly ſurpriſed at this new and unknown ſenſation. After ſome time, a kind of humour iſſued from his left ear, and he then heard perfectly well with both. During theſe three months, he liſtened to every thing; and without attempting to ſpeak aloud he accuſtomed himſelf to utter ſoftly the words ſpoken by others. He laboured hard alſo in acquiring the pronunciation of words, and in learning the ideas of which they are expreſſive. At length, having ſuppoſed himſelf qualified to break ſilence, he declared, that he could now ſpeak, though as yet but imperfectly. Soon after, ſome able divine queſtioned him concerning his ideas of his paſt ſtate; and principally with reſpect to God, his ſoul, the moral beauty of virtue and deformity of vice. The young man, however, had not directed his ſolitary ſpeculations into that channel. He had gone to maſs indeed with his parents, had learned to ſign himſelf with the croſs, to kneel down, and to aſſume all the grimaces of a man in the act of devotion. But he did all this without any manner of knowledge of the intention or the cauſe; he ſaw others do the like, and that was enough for him. He had formed no idea of death; but he led a life of pure animal inſtinct; and though entirely taken up with ſenſible objects, and ſuch as were preſent, he yet did not ſeem to have made ſuch reflections even upon theſe, as might reaſonably have been expected. The young man was not, however, deficient in underſtanding; but the underſtanding of a man, deprived of all commerce with others, is ſo very confined, that the mind may be ſaid to be under the controul of its immediate ſenſations.

" It is highly poſſible, nevertheleſs, to communicate ideas to deaf men, which they previouſly wanted, and even to give them very preciſe notions of abſtract, and general ſubjects, by means of ſigns, and of letters. A perſon born deaf, may, by time and application, be taught to read, to write, and even, by the motions of the lips, to underſtand what is ſaid to him. This is a plain proof how much the ſenſes reſemble, and may ſupply the defects of each other. It is probable, however, that, as moſt of the motions of ſpeech are made within the mouth by the tongue, the knowledge from the motion of the lips, can be but very confined.

The ſenſe of feeling is ſpread over the whole body, but it employs itſelf differently in different parts. The ſenſation which reſults from feeling, cannot be excited otherwiſe than by the contact and immediate application of the ſuperficies of ſome foreign body to that of our own. If we apply a foreign body againſt the breaſt, or upon the ſhoulder of a man, he will feel it; that is, he will know that there is a foreign body which touches him. But he will not have a ſingle idea of the form of this body, becauſe the breaſt touching the body in a ſingle plain, or ſurface, he cannot gather from it, any knowledge of this body. It is the ſame with reſpect to all other parts of the body, which cannot adjuſt themſelves upon the ſurface of foreign bodies, and bend themſelves, to embrace at one time, many parts of their ſuperficies. Theſe parts of our body cannot, therefore, give any juſt idea of their form; but thoſe on the contrary, which, like the hand, are divided into many ſmall flexible and moveable parts; and which conſequently, can apply themſelves at one and the ſame time, upon the different plains of the ſuperficies of the body, are thoſe, which, in effect, give us the ideas of their form, and of their ſize.

It is not, therefore, only becauſe there is a greater quantity of nervous tufts, at the extremity of the fingers than in any other part of the body. It is not, as it is vulgarly pretended, becauſe the hand has the moſt delicate ſenſe, that it is in effect the principal organ of feeling. On the contrary, we can ſay, that there are parts more ſenſible, and where the ſenſe of feeling is more delicate, as the eyes, the tongue, &c. But it is merely becauſe the hand is divided into many parts all moveable, all flexible, all acting at ſame time, and all obedient to the will; it is, becauſe, it is the only organ which gives us diſtinct ideas of the form of bodies. Animals which have hands, appear to be the moſt acute. Apes do things ſo like the mechanical actions of man, that it ſeems as if they had the ſame ſucceſſion of corporeal ſenſation for the cauſe of them. Animals, which are deprived of this organ, as they cannot graſp any object, and as they have not any part divided and flexible enough to be able to adjuſt itſelf upon the ſuperficies of bodies, they certainly have not any preciſe notion of the form, or of the ſize of them. It is for this reaſon that we often ſee them in ſuſpence, or frightened at the aſpect of objects which are the moſt familiar to them. The principal organ of their feeling is the muzzle, as this part is divided in two by the mouth and as the tongue is another part, that ſerves them at the ſame time to touch bodies which we ſee them turn and turn again before they take them between their teeth.

It is therefore to the ſenſe of feeling that we are indebted for the power of uſefully exerciſing all our other faculties. One man does not, perhaps, poſſeſs more ingenuity or capacity than another; but becauſe in his earlieſt infancy he made a greater, and a readier uſe of this ſenſe. As ſoon as children are indulged with the liberty of their hands, they preſently bring them into action, and are fond of touching whatever is preſented to them. They are ſeen to amuſe themſelves, and to take a pleaſure in handling every thing they are capable of graſping. They ſeem as if they were endeavouring to find out the form of bodies, by touching them on every ſide; and for a conſiderable time, they amuſe themſelves in this manner, or rather they inform themſelves of new objects.

C H A P. VI.

OF THE APPARENT VARIETIES IN THE HUMAN SPECIES—LAPLANDERS—TARTARS—CHINESE—JAPANESE—FORMOSANS—MOGULS—PERSIANS ARABIANS—CIRCASSIANS—TURKS—RUSSIANS—NEGROES—HOTTENTOTS—AMERICANS—CAUSES OF THIS VARIETY.

THERE are many cauſes which contribute to the producing of an apparent variety between the different nations of the globe. Climate, food, manners and cuſtoms produce not only a difference in ſentiment, but even in the external form of different people.

In examining the ſurface of the earth, and beginning our enquiries from the north, we find in Lapland, and in the northern parts of Tartary, a race of ſmall-ſized men, whoſe figure is uncouth, and whoſe phyſiognomy is as wild as their manners are unpoliſhed. Though they ſeem to be of a degenerate ſpecies, they are very numerous, and occupy vaſt regions.

The Laplanders, the Danes, the Swedes, the Muſcovites, the inhabitants of Nova-Zembla, the Borandians, the Samoeids, the Oſtiacs of the old continent, the Greenlanders, and the ſavages to the north of the Eſquimaux Indians of the new continent, appear to be of one common race, which has been extended and multiplied along the coaſts of the northern ſeas, and over deſarts, conſidered as uninhabitable by every other nation. In theſe countries, the viſage is large and broad, the noſe is flat and ſhort, the eyes are of a yellowiſh brown, inclining to black, the eye-lids are drawn toward the temples, the cheek-bones are extremely prominent, the mouth is very big, the lower part of the countenace is very narrow, the lips are thick and turned outward, the voice is ſhrill, the head is bulky. The hair is black and ſtraight, and the ſkin is tawny. They are ſmall in ſtature, and, though meagre, they are of a ſquat form. In general, their ſize is about four feet, nor do the talleſt exceed four and a half; and among theſe people, if there is any difference to be found, it depends on the greater or leſs degree of deformity.

The Daniſh Laplanders have a large black cat, which they make a confident of all their ſecrets, and a counſellor in all their difficulties. Among the Swediſh Laplanders, there is in every family a drum, for the purpoſe of conſulting the devil: and notwithſtanding the natives of theſe countries are robuſt and nimble, from many circumſtances there is reaſon to ſuppoſe, that they cannot live but in their own country, and in their own manner. In travelling over the ice and ſnow, they uſe ſkates made of fir, which are about two feet long, and about half a foot broad, which are raiſed and pointed before, and faſtened to the foot by ſtraps of leather. With theſe they make ſuch diſpatch, that they eaſily overtake the ſwifteſt animals. They alſo uſe a pole, pointed with iron at one end, and rounded at the other. This pole ſerves to puſh them along, to direct their courſe, to keep them from falling, to ſtop the impetuoſity of their career, and to kill what game they overtake. With their ſkates they deſcend the ſteepeſt mountains, and ſcale the moſt craggy precipices; nor are the women leſs ſkilful in ſuch exerciſes than the men. They are all accuſtomed to the bow and arrow; and it is aſſerted, that the Muſcovite Laplanders launce a javelin with ſo much dexterity, that at the diſtance of thirty paces, they are ſure to hit a mark no larger than a ſilver crown, and with ſuch force, that it will transfix a human body. As huntſmen, their favourite purſuit is that of the ermine, the fox, the lynx, and the martin; and of theſe animals, they barter the ſkins for their favourite articles of luxury, brandy and tobacco.

In winter the Laplanders clothe themſelves with the ſkin of the rein-deer, and in ſummer with the ſkins of birds. To the uſes of linen they are perfect ſtrangers. The women of Nova-Zembla have their noſe and their ears pierced, in order to have them ornamented with pendants of blue ſtone; and alſo, as an additional luſtre to their charms, they form blue ſtreaks upon their forehead and chin. Thoſe of Greenland dreſs themſelves with the ſkin of the dog fiſh. They alſo paint the viſage with blue and yellow colours, and wear pendants in the ears. They all live under ground, or in huts almoſt entirely covered with earth, and with the bark of certain trees, or the ſkin of certain fiſhes. Some even form ſubterranean trenches, by which one hut communicates with another, and by which, during the winter-months, they enjoy the converſation and ſociety of their neighbours. A continued ſeries of darkneſs for ſeveral months, obliges them to illuminate their dreary abode with lamps, which they keep alive with that very train-oil they uſe as drink. Under all theſe hardſhips, they are ſubject to few diſeaſes, and they live to a prodigious age. So vigorous indeed are the old men, that they are hardly to be diſtinguiſhed from the young. The only infirmity they experience, and it is an infirmity common to them all, is blindneſs. Dazzled by the ſtrong reflection of the ſnow, in winter, and inveloped in clouds of ſmoke in autumn and ſpring, when advanced in years, they ſeldom retain the uſe of their eyes.

The Tartar country, taken in general, comprehends the greateſt part of Aſia, and extends even from Ruſſia to Kamtſchatka. It is from eleven to twelve hundred leagues long, and about ſeven hundred broad, of courſe its circumference is twenty times larger than that of the whole kingdom of France.

All the Tartar nations have the upper part of the viſage very large and wrinkled, even in their youth. Their noſe is ſhort and flat, their eyes are little, and ſunk in the head; their cheek bones are high; the lower part of their viſage is narrow; their chin is long and prominent; their teeth are long and ſtraggling; their eye-brows are ſo large as to cover the eyes; their eye-lids are thick; the face is broad and flat; their complexion is tawny, and their hair is black. They have but little beard, have thick thighs, and ſhort legs, and, though but of middling ſtature, they are remarkably ſtrong and robuſt. The ugliest of them are the Calmoncks, in whoſe appearance there ſeems to be ſomething frightful. They are all wanderers and vagabonds; and their only ſhelter is that of a tent made of hair or ſkins. Their food is horſe fleſh and camel-fleſh, either raw, or a little ſodden between the horſe and the ſaddle. They eat alſo fiſh dried in the ſun. Their moſt common drink is mare's milk, fermented with millet ground into meal. They all have the head ſhaved, except a tuft of hair on the top, which they let grow ſufficiently long to form into treſſes on each ſide of the face. The women, who are as deformed as the men, wear their hair, which they bind up with bits of copper, and other ornaments of the ſame nature.

The majority of theſe tribes are ſtrangers to religion, morality, and decency. They are robbers by profeſſion; and the natives of Dagheſtan, who live in the neighbourhood of more poliſhed countries, carry on a great traffic of ſlaves, whom they carry off by ſorce, and afterwards ſell to the Turks and the Perſians. Their wealth conſiſts chiefly of horſes, which are more numerous, perhaps, in Tartary, than in any other part of the world. They are taught, by cuſtom, to live in the ſame place with their horſes. They are continually employed in training and exerciſing them; and at length they reduce them to ſuch implicit obedience, that they actually appear to underſtand the intention of the rider.

The limbs of the Chineſe are well-proportioned, their bodies are large and fat, their viſages are large and round. Their eyes are ſmall, their eye-brows are large, their eye-lids are turned upwards, and their noſes are ſhort and flat. Their beards are black, upon their chins there is very little hair, and upon each lip their are not more than ſeven or eight prickles. Thoſe who inhabit the ſouthern provinces of the empire, are more brown and tawny than the others. In colour, they reſemble the natives of Mauritania, and the more ſwarthy Spaniards; but thoſe who inhabit the middle provinces, are as fair as the Germans.

Le Gentel aſſures us, that the Chineſe women do every thing in their power to make their eyes appear little, and oblong. For this purpoſe, it is a conſtant practice with the little girls, from the inſtruction of the mother, forcibly to extend their eye-lids; and with the addition of a noſe thoroughly compreſſed and flattened, of ears long, large, open, and pendant, they are accounted complete beauties. He adds, that their complexion is delicate, their lips are of a fine vermillion, their mouth is well-proportioned, their hair is very black; but that, by the uſe of paint, they ſo greatly injure their ſkin, that, before the age of thirty, they have every appearance of old age.

So ſtrongly do the Japaneſe reſemble the Chineſe, that we can hardly ſcruple to rank them in the ſame claſs. As being inhabitants of a more ſouthern climate, they only differ from them in being more yellow, or more brown. In general, their ſtature is ſmall, their face, as well as their noſe, is broad and flat, their hair is black, and their beard is little more than perceptible. They are haughty, fond of war, full of dexterity and vigour, civil and obliging, ſmooth-tongued, and courteous, but fickle and vain. With aſtoniſhing patience, they ſuſtain hunger, thirſt, cold, heat, fatigue, and all the other hardſhips of life. Their ceremonies, or rather grimaces, in eating, are numerous and uncouth. They are laborious, are very ſkilful artificers, and, in a word, have nearly the ſame diſpoſition, the ſame manners, and the ſame cuſtoms, as the Chineſe.

One cuſtom which they have in common, and which is not a little fantaſtic, is, ſo to contract the feet of the women, that they are hardly able to ſupport themſelves. Some travellers mention, that in China, when a girl has paſſed her third year, they break the foot in ſuch a manner, that the toes are made to come under the ſole; that they apply to it a ſtrong water, which burns away the fleſh; and, that they wrap it up in a number of bandages, till it has aſſumed a certain fold.

They add, that the women feel the pain of this operation all their lives; that they walk with great difficulty; and that their gait is to the laſt degree ungraceful. Other travellers do not ſay that they break the foot in their infancy, but that they only compreſs it with ſo much violence as to prevent its growth; but they unanimouſly allow, that every woman of condition, and even every handſome woman, muſt have a foot ſmall enough to enter, with eaſe, the ſlipper of a child of ſix years old.

Though the inhabitants of the kingdoms of Pegu and Aracan are blacker, yet they bear all a conſiderable reſemblance to the Chineſe. Thoſe of Aracan put great value upon a forehead large and flat; and, in order to render it ſo, they apply a plate of lead to the forehead of their children, as ſoon as they are born. Their noſtrils are large, and extended; their eyes are ſmall and lively; and their ears are of ſuch length as to hang over their ſhoulders. They feaſt with a reliſh on mice, on rats, on ſerpents, and on fiſh, however it may ſtink. Their women are tolerably fair, and their ears are as long as thoſe of the men. The people of Achan, who are ſituated farther to the north than thoſe of Aracan, have alſo a flat viſage, and an olive-coloured ſkin. They allow their boys to go quite naked, and their girls with only a ſlight plate of ſilver over thoſe parts which nature dictates to conceal.

Northward of the Philippine Iſlands is ſituated the iſland Formoſa, of which the natives, though at no great diſtance from the coaſt of Fokian in China, bear not the leaſt reſemblance to the Chineſe. According to Struys the Formoſans are of a ſmall ſtature, particularly thoſe who inhabit the mountains, and their viſage is broad. The women have large and full breaſts, and a beard like the men. Their ears, are naturally long, and they render them ſtill more ſo by certain thick ſhells, which they wear as pendants. Their hair is very black, and very long, and their complexion is yellowiſh. Theſe iſlanders, though averſe to labour, are yet admirably ſkilled in the uſe of the javelin, and bow. They are alſo excellent ſwimmers; and when they run, their ſwiftneſs is incredible.

The Moguls, and the other inhabitants of the peninſula of India, are not unlike the Europeans in ſhape and in features; but they differ more or leſs from them in colour. The Moguls are of an olive complexion; and yet, in the Indian language, the word *Mogul* ſignifies *White*. The women are extremely delicate, and they bathe very often. They are of an olive colour, as well as the men; and, contrary to what is ſeen among the women of Europe, their legs and thighs are long, and their body is ſhort. Tavernier ſays, that, after paſſing Lapor, and the kingdom of Caſhmire, the women have no hair on any part of the body, and the men have hardly any beard. According to Thevenot, the Mogul women are tolerably fruitful, though exceedingly chaſte. They likewiſe ſuffer little from the pains of child-birth, and are often known to be abroad the day following. He adds, that in the kingdom of Decan they are allowed to marry, the huſband by his tenth, and the wife by her eighth year; and at that age they pretty often have children. The women who become mothers ſo ſoon, uſually ceaſe bearing, however, before they arrive at thirty; and by that period, they appear wrinkled, and marked with all the deformities of age.

The cuſtoms of the different nations of India are all very ſingular, if not whimſical. The Banians eat nothing which has had life in it;

and they are even afraid to kill the ſmalleſt reptile, however offenſive to them. They throw rice and beans into their rivers as food for the fiſhes, and grain of different kinds upon the earth for the birds and inſects. When they meet with a huntſman, or a fiſher, they beg of him inſtantly to deſiſt from his employment. If he remain deaf to their intreaties, they offer him money for his gun, or his nets; and when no perſuaſion, no offer, will avail, they trouble the water, in order to frighten the fiſhes, and cry with all their might, to put the birds and other game to flight.

In Ceylan there is a ſpecies of ſavages, denominated *Bedas*, who occupy a ſmall diſtrict on the north part of the iſland; and ſeem to be totally different from all the nations around them. The ſpot they inhabit is entirely covered with wood, amidſt which they keep themſelves ſo cloſely concealed, that it is with great difficulty they are diſcovered. Their complexion is fair, and ſometimes even red, like that of the Europeans. They do not ſpeak the language of Ceylan; nor indeed has their language the leaſt affinity to that of any of the other Indians. They have no villages, no houſes, no intercourſe with the reſt of mankind. Their arms are, the bow and the arrow, with which they deſtroy a number of boars, ſtags, and other animals; and though they never dreſs their meat, they ſweeten it with honey, which they poſſeſs in great abundance.

The inhabitants of Perſia, of Turkey, of Arabia, of Egypt, and of the whole of Barbary, may be conſidered as one and the ſame people, who, in the time of Mahomet, and of his ſucceſſors, invaded immenſe territories, extended their dominions, and incorporated with the original natives of all thoſe countries. The Perſians, the Turks, and the Moors, are to a certain degree civilized; but the Arabians have, for the moſt part, remained in a ſtate of independance, which implies a contempt of laws. They live, like the Tartars, without order, without government, and almoſt without ſociety. Theft, robbery, and violence are authoriſed by their chiefs. They glory in their vices; and of all human conventions, thoſe only have they admitted, which owe their exiſtence to fanaticiſm and ſuperſtition.

They are a people much inured to labour; and to it they habituate their horſes. They allow this animal to eat or drink but once in twenty-four hours; and though their horſes are meagre, they are excellent courſers, and ſeem indefatigable.

The Egyptian women are very brown; their eyes are lively; their ſtature is rather low; their mode of dreſs is by no means agreeable; and their converſation is perfectly tireſome. But though the women of Egypt are commonly rather ſhort, yet the men are of a good height. Both are of an olive colour; and the farther we remove from Cairo, the more we find the people tawny, till we reach the confines of Nubia, where they are as black as the Nubians themſelves.

The moſt inherent defects of the Egyptians are, idleneſs and cowardice. They do nothing almoſt the whole day but drink coffee, ſmoke, ſleep, remain indolent in one place, or chatter in the ſtreets. They are highly ignorant, and are full of the moſt ridiculous vanity. Though they cannot deny but that they have loſt every thing noble they once poſſeſſed; the ſciences, the exerciſe of arms, their hiſtory, and even their language; and that, from an illuſtrious and a valiant nation, they have become a people daſtardly and enſlaved; they ſcruple not to deſpiſe all other nations, and to take offence at the bare offer of carrying their children into Europe, in order to initiate them in the arts and ſciences.

"The women of Circaſſia," ſays Struys, "are exceedingly fair and beautiful. Their complexion is incomparably fine; their forehead is large and ſmooth; and, without the aſſiſtance of art, their eye-brows are ſo delicate, that they appear as threads of ſilk. Their eyes are large, ſoft, but full of animation, their mouth is ſmall and expreſſive of a ſmile, and their chin, forms a perfect oval. Their neck and breaſts are admirably formed; their ſtature is tall, and the ſhape of their body eaſy; their ſkin, is white as ſnow, and their hair of the moſt beautiful black. They wear a little cap of a black ſtuff over which they faſten a roller of the ſame colour; but, what is truly ridiculous, is, that, inſtead of this roller, the widows wear the bladder of an ox, or a cow, inflated as much as poſſible, by which they disfigure themſelves amazingly. In the ſummer months, the inferior claſſes wear nothing but a ſhift, which is open down to the middle, and which is generally of a blue, yellow, or red colour. They are tolerably familiar with ſtrangers, but at the ſame time faithful to their huſbands, who are by no means jealous of them."

The Turks, who purchaſe a vaſt number of theſe women as ſlaves, are a people compoſed of many different nations. From the Armenians, the Georgians, the Turcomans, intermixing in the time of the cruſades, with the Arabians, the Egyptians, and even the Europeans, it is hardly poſſible to diſtinguiſh the native inhabitants of Aſia Minor, of Syria, and of the reſt of Turkey. The Turkiſh men are generally robuſt, and tolerably well made; and it is even rare to find among them perſons either hump-backed or lame. The women are generally beautiful, well proportioned, and free from blemiſhes. They are very fair, becauſe they ſeldom ſtir from home; and when they go abroad they are always veiled.

Before the Czar Peter I. we are told, that the Muſcovites had not emerged from barbariſm. Born in ſlavery, they were ignorant, brutal, cruel, and deſtitute of courage. Men and women bathed promiſcuouſly in ſtoves hated to a degree intolerable to all perſons but themſelves; and on quitting this warm bath, they plunged, like the Laplanders, into cold water. Their food was homely; and their favourite diſhes were cucumbers, or melons, of Aſtracan, which, in ſummer, they preſerved in a mixture of water, flour, and ſalt. From ridiculous ſcruples they abſtained from ſeveral viands, amongſt which were pigeons and veal. Nevertheleſs, at this period of rudeneſs, the women were ſkilled in the arts of colouring the ſkin, of plucking out the eye brows, and of painting artificial ones. They alſo adorned themſelves with pearls and jewels, and their garments were made of rich and valuable ſtuffs. From theſe circumſtances does it not appear, that the barbariſm of the Muſcovites was near a cloſe, and that their ſovereign had leſs trouble in poliſhing them than ſome authors have endeavoured to inſinuate? They are now a people in ſome degree civilized and commercial, fond of ſpectacles, and of other ingenious novelties.

From the regions of Europe and Aſia, our attention is now to be directed to a race of people differing more from ourſelves in external appearances than any we have hitherto mentioned.

In the ſeventeenth or eighteenth degree of north latitude, on the African coaſt, we find the negroes of Senegal and of Nubia, ſome in the neighbourhood of the ocean, and others in that of the red ſea. After them, all the nations of Africa, from the latitude of eighteen North to that of eighteen South, are black, the Ethiopians, or Abyſſinians excepted. It appears, then, that the portion of the globe which Nature has allotted to this race of men, contains an extent of ground, parallel to the equator, of about nine hundred leagues in breadth, and conſiderably more in length, eſpecially northward of the equator. Beyond the latitude of eighteen or twenty, there are no more Negroes, as will appear when we come to ſpeak of the Caffres, and of the Hottentots.

By confounding them with their neighbours the Nubians, we have been long in an error, with reſpect to the colour, and the features of the viſage of the Ethiopians. Marmol ſays, that the Ethiopians are abſolutely black, that their viſage is large, and their noſe flat; and in this deſcription the Dutch travellers agree with him. The truth, however, is, that they differ from the Nubians, both in colour and in features. The ſkin of the Ethiopians is brown, or olive-coloured, like that of the ſouthern Arabians, from whom, it is probable, they derive their origin. In ſtature they are tall: the features of their countenance are ſtrongly marked: their eyes are large and beautiful: their noſe is well proportioned: their lips are thin; and their teeth are white. Of the inhabitants of Nubia, on the contrary, the noſe is flat, the lips are thick and prominent, and the countenance is exceedingly black. Theſe Nubians, as well as the Barberins, their weſtern neighbours, are a ſpecies of Negroes not unlike thoſe of Senegal.

The Ethiopians are a people between the extremes of barbariſm and of civilization. Their garments are of cotton, though thoſe of the more opulent are of ſilk. Their houſes are low, and of a bad conſtruction. Their lands, too, are wretchedly neglected. Theſe circumſtances are owing to the behaviour of their nobles, who deſpiſe the tradeſmen and the common people. Each of theſe claſſes, however, lives ſeparate from the other, and has its own villages or hamlets. Unprovided with ſalt at home, they purchaſe it from abroad for its weight in gold. So fond are they of raw meat, that, at their feaſts, the ſecond courſe, which is conſidered as the moſt delicate, conſiſts of it entirely. Though they have vines they have no wine; and their uſual beverage is a ſour compoſition made with tamarinds. They uſe horſes for the purpoſe of travelling, and mules for that of carrying their merchandize. Of the arts or ſciences they have little knowledge. Their language is without rules; and their manner of writing, though their characters are more beautiful than thoſe of the Arabians, is ſo imperfect, that, they take ſeveral days to write a letter. In their mode of ſalutation there is ſomething exceedingly whimſical. Each takes the right hand of the other, and carries it to his mouth; after, the ſaluter takes off the ſcarf of the perſon ſaluted, and faſtens it round his own body: Thus the latter is left half naked, few of the Ethiopians wearing any more than this ſcarf, and a pair of cotton drawers.

The firſt Negroes we meet with, are thoſe who live on the ſouth ſide of Senegal. Theſe people, as well as thoſe who occupy the different territories between Senegal and Gambia, are called *Jaloſes*. They are all very black, well-proportioned, and of a ſize ſufficiently tall. Their features are leſs harſh than thoſe of the Negroes; and ſome of them eſpecially of the female ſex, have features that are far from being irregular. With reſpect to beauty, they value fine eyes, a well-made noſe and mouth, and lips of a proportional ſmallneſs moſt. With reſpect to the ground of the picture alone, do they differ from us; for, with them, the colour muſt be exceedingly black and gloſſy. Their ſkin, however, is highly delicate, and ſoft; and, colour excepted, we find among them women as handſome as in any other country of the world. They are uſually very gay, lively and amorous.

Father du Tertre ſays expreſsly, that, if the Negroes are for the moſt part flat-noſed, it is becauſe the parents cruſh the noſes of their children. He adds that they compreſs their lips too, in order to render them more thick; and that, of the few who have undergone neither of theſe operations, the features of the countenance are as comely, the noſe is as prominent, and the lips are as delicate, as thoſe of the Europeans. It appears however, that, among the Negroes in general, thick lips and a noſe broad and flat, are gifts from nature, by which was originally introduced, and at length eſtabliſhed, their cuſtom of flattening the noſe and thickening the lips of ſuch as, at their birth, diſcovered a deficiency in theſe ornaments.

Though the Negroes of Guinea are in general very healthy, yet they ſeldom attain what we term old age. In his own country, a Negroe at the age of fifty, is a very old man; and ſo early as at that of forty, he diſcovers all the marks of being ſo.

The Negroes in general are remarkably innocent and inoffenſive. If properly fed, and not expoſed to bad uſage, they are contented, joyous and obliging; and on their very countenance we may read the ſatisfaction of their ſoul. If hardly dealt with, on the other hand, their ſpirits forſake them, and they droop with ſorrow. Alike impreſſed with a ſenſe of what injuries, and of what favours they have received, to a cruel maſter they are implacable foes. But for an indulgent one, they are ſervants who will exert every effort of which human nature is capable, in order to expreſs to him their zeal and attachment. To their children, their friends, their countrymen, they are naturally compaſſionate and tender. Contented with the little they have, they communicate a ſhare to thoſe who are in indigence. That they have an excellent heart, therefore, is evident; and, in having this, they have the ſeed of every virtue. Their ſufferings demand a tear. Are they not already ſufficiently unhappy in being reduced to a ſtate of ſlavery; in being obliged to work without reaping the ſmalleſt fruits of their labour? To crown their wretchedneſs, muſt they be abuſed, buffeted, treated like brutes? Humanity revolts at the idea of a conduct, which nothing but the thirſt of gold could ever have introduced, and of which, every day will produce an aggravated repetition, till an enlightened legiſlature ſhall put an end to a traffic which diſgraces human nature.

Mr Kolbe, though he has given ſo minute a deſcription of the Hottentots, is ſtrongly of opinion, however, that they are Negroes. Like that of the latter, he aſſures us, their hair is ſhort, black, frizzled and woolly; nor in a ſingle inſtance did he ever obſerve it long.

Though of all the Hottentots the noſe is very flat, and very broad, yet it would not be of that form, did not their mothers, conſidering a prominent noſe as a deformity cruſh it preſently after their birth. Their lips are alſo thick, and their upper lip is particularly ſo: their teeth are very white: their eye-brows are thick: their head is large: their body is meagre; and their limbs are ſlender. They ſeldom live above forty years; and of this ſhort duration of life, the cauſes, no doubt, are, their reſiding continually in the midſt of filth, as alſo their living upon meat that is tainted, of which indeed their nouriſhment chiefly conſiſts. I might dwell longer upon the deſcription of this naſty people; but as moſt travellers have already given very accurate accounts of them, it might be thought unneceſſary in this place. One fact, however, related by Tavernier, I ought not to paſs in ſilence. The Dutch, he ſays, once took a Hottentot girl, ſoon after her birth; and, after bringing her up among themſelves, ſhe became as white as an European. From this circumſtance he preſumes, that all the Hottentots would be tolerably white, were it not for their cuſtom of perpetually begriming themſelves.

Though in America we obſerve leſs variety in the human form than might be expected, it cannot be ſuppoſed, but that in ſuch a diverſity of climates and ſituations, a conſiderable diverſity of inhabitants muſt alſo be found.

In beginning our enquiries, then, we find in the moſt northern parts of America a ſpecies of Laplanders, ſimilar to thoſe of Europe, or to the Samoeids of Aſia; and though, in compariſon of the latter, they are few in number, yet they are diffuſed over a very conſiderable extent of ground. Thoſe who inhabit the lands of Davis's Strait, are of a diminutive ſize, of an olive complexion, and their legs are ſhort and thick. They are ſkilful fiſhers. They eat their fiſh and their meat raw. Their drink conſiſts of pure water, or of the blood of the dog-fiſh. They are alſo very ſtrong, and generally live to a great age. Here, we ſee, therefore, the figure, the colour, and the manners of the Laplanders. But what is truly ſingular is, that, as among the Laplanders of Europe, we meet with the Finlanders, who are white, comely, tolerably tall, and tolerably well made; ſo, among the Laplanders of America we meet with another ſpecies of men, tall, well made, tolerably white, and with features exceedingly regular.

Of a different race from the former ſeem to be the ſavages of Hudſon's Bay, and northward of the land of Labrador. They are ugly, however, diminutive, and unſhapely; and their viſage is almoſt entirely covered with hair, like the ſavages of the country of Yeco, northward of Japan. In ſummer they dwell under tents made of ſkins of the rein-deer. In winter they live under ground, like the Laplanders and the Samoeids, and, like them, ſleep together promiſcuouſly, and without the ſmalleſt diſtinction. They likewiſe live to a great age, though they feed on nothing but raw meat and fiſh. The ſavages of Newfoundland have a conſiderable reſemblance to thoſe of Davis's Strait: they are low in ſtature: they have little or no beard: their viſage is broad and flat: their eyes are large: they are generally rather flat-noſed: and, upon the whole, are far from being unlike the ſavages of the north continent, and of the environs of Greenland.

Beſides theſe ſavages, who are ſcattered over the moſt northern parts of America, we find greater numbers, and which are perfectly different, in Canada, and in the vaſt extent of land to the Aſſiniboils.

Theſe are tolerably tall, robuſt, vigorous, and well made. They have hair and eyes black, teeth very white, a complexion tawny, beard ſcanty, and over the whole of their body hardly a veſtige of hair. They are hardy, indefatigable walkers, and very nimble runners. They are alike unaffected by exceſſes of hunger, and of ſatiety. They are by nature bold and fierce, grave and ſedate. So ſtrongly, indeed, do they reſemble the Oriental Tartars in the colour of the ſkin, the hair, and the eyes, in the ſcantineſs of beard, and of hair, as alſo in diſpoſition, and in manners, that, were they not ſeparated from each other by an immenſe ſea, we ſhould conclude them to be deſcended from that nation. In point of latitude, their ſituation is alſo the ſame, which ſtill farther proves, how powerfully the climate influences not only the colour, but the figure of men.

Mr Fabry, who travelled a prodigious way to the northweſt of the Miſſiſſippi, and viſited places which no European had done before him, and of which, conſequently, the ſavage inhabitants had not been deſtroyed, has aſſured me, that that part of America is ſo deſerted, that he often travelled an hundred, and two hundred leagues, without obſerving a ſingle human face, or the ſmalleſt veſtige of an habitation. He adds, that, whenever he did meet with any habitations, they were always at immenſe diſtances from one another; and that, in each of them, there was frequently not above one family. Sometimes he ſays there were two or three families, but never above twenty perſons together; and between theſe twenty perſons and twenty others, there was generally a ſpace of a hundred leagues at leaſt.

To dwell long on the cuſtoms of ſuch ſavage nations, would, in my opinion, be unneceſſary. It has not been always attended to by authors, that what they have given us for eſtabliſhed cuſtoms, and for the manners of a community, were nothing more than actions peculiar to a few individuals, and often determined by circumſtances, or by caprice. Some nations, they tell us, eat their enemies, ſome burn them, and ſome mutilate them. One nation, they ſay, is perpetually at war; and of another, the grand object is to live in peace; in one country, the child kills his parent, when he has lived to a certain age; and in another, the parent eats his child. All theſe ſtories, on which travellers have with ſo much complacency enlarged, mean nothing more than that one ſavage had devoured his enemy, another had burned or mutilated him, and a third had killed or eaten his child. All theſe things may be known to happen in one, as well as in ſeveral ſavage nations. For every nation in which there is no government, no law, no maſter, no habitual ſociety, ought rather to be termed a tumultuous aſſemblage of men, barbarous and independent. Men who obey nothing but their own private paſſions, and who, incapable of having a common intereſt, are alſo incapable of purſuing one object, and of ſubmitting to fixed and ſettled uſages.

If, however, in the whole of North America, there were none but ſavages to be met with, in Mexico, and in Peru, there were found nations poliſhed, ſubjected to laws, governed by kings, induſtrious, acquainted with the Arts, and not deſtitute of religion.

In the preſent ſtate of theſe countries, ſo intermixed are the inhabitants of Mexico and New Spain, that we hardly meet with two viſages of the ſame colour. In the town of Mexico, there are white men from

Europe, Indians from the north, and from the ſouth of America, and negroes from Africa, &c. inſomuch, that the colour of the people exhibits every different ſhade which can ſubſiſt between black and white. The real natives of the country are very brown, and of an olive colour, well made, and active; and though they have little hair, even upon the eye-brows, yet upon their head, their hair is very long, and very black.

In ſurveying the different appearances which the human form aſſumes in the different regions of the earth, the moſt ſtriking circumſtance is that of colour. This circumſtance has been attributed to various cauſes; but in my opinion experience warrants us to affirm that the heat of the climate is the principal one. When this heat is exceſſive, as at Senegal and in Guinea, the inhabitants are entirely black. When it is rather leſs violent, as on the eaſtern coaſts of Africa, they are of a ſhade more light When it begins to be ſomewhat more temperate, as in Barbary, in India, in Arabia, &c. they are only brown; and, when it is altogether temperate, as in Europe and in Aſia, they are white. Theſe varieties are wholly owing to their various modes of living. All the Tartars, for example, are tawny, while the Europeans, who live in the ſame latitude, are white. Of this difference the reaſons ſeem to be, that the former are always expoſed to the air; that they have no towns, no fixed habitations; that they ſleep upon the earth, and live coarſely in every reſpect. Theſe circumſtances alone are ſufficient to render them leſs white than the Europeans, to whom nothing is wanting which may render life comfortable and agreeable. Why are the Chineſe more white than the Tartars, whom they reſemble in all the features of the viſage? It is becauſe they live in towns, becauſe they are civilized, becauſe they are provided with every expedient for defending themſelves from the injuries of the weather, to which the Tartars are continually expoſed.

When cold becomes extreme, however, it produces ſome effects ſimilar to thoſe of exceſſive heat. The Samoeids the Laplanders, the Greenlanders, are very tawny; and it is even aſſerted, as we have already obſerved, that, among the Greenlanders, there are men as black as thoſe of Africa. Violent cold, and violent heat, produce the ſame effect upon the ſkin; for theſe two cauſes act by one quality, which they poſſeſs in common. This quality is dryneſs; and as it is a quality of which intenſe cold is equally productive as intenſe heat, ſo by the former, as well as by the latter, the ſkin may be dried up, altered, and rendered as tawny as what we find it among the Laplanders. Cold compreſſes, ſhrivels, and reduces within a narrow compaſs, all the productions of nature. Hence we find the Laplanders, who are perpetually expoſed to all the rigours of the moſt piercing cold, the moſt diminutive of the human ſpecies.

The moſt temperate climate is between the degrees of forty and fifty. There we behold the human form in its greateſt perfection; and there we ought to form our ideas of the real and natural colour of man. Situated under this zone, the civilized countries are, Georgia, Circaſſia, the Ukarine, European Turkey, Hungary, South Germany, Italy, Switzerland, France, and the North of Spain. Of the latter the inhabitants are the moſt beautiful, and the moſt ſhapely, in the world.

As the firſt, and almoſt the ſole, cauſe of the colour of mankind, we ought therefore to conſider the climate; and though upon the ſkin the effects of nouriſhment are trifling, when compared with thoſe of the air and ſoil, yet upon the form they are prodigious. Food which is groſs, unwholeſome, or badly prepared, has a ſtrong and a natural tendency to produce a degeneracy in the human ſpecies. Hence in all countries where the people fare wretchedly, they are more ugly, and more deformed than their neighbours.

The air and the ſoil have alſo great influence, not only on the form of men, but on that of animals, and of vegetables. In comparing the peaſants who live on hilly grounds, with thoſe who live imboſomed in the neighbouring valleys, we find, that the former are active, nimble, well ſhaped, and lively; and the women generally handſome. On the contrary, the latter, in proportion as the air, food and water are groſs, are clumſy, and leſs active and vigorous.

From every circumſtance, therefore, we may obtain a proof, that mankind are not compoſed of ſpecies eſſentially different from each other. It appears on the contrary, that there was originally but one individual ſpecies of men, which, after being multiplied and diffuſed over the whole ſurface of the earth, underwent divers changes, from the influence of the climate, from the difference of food, and of the mode of living, from epidemical diſtempers, as alſo from the intermixture, varied *ad infinitum*, of individuals more or leſs reſembling each other: at firſt, theſe alterations were leſs conſiderable, and confined to individuals; but, afterwards, from the continued action of the above cauſes becoming more general, more ſenſible, and more fixed, they formed varieties in the ſpecies. Theſe varieties have been, and are ſtill, perpetuated from generation to generation, in the ſame manner as certain deformities, and certain maladies, paſs from parents to their children. And in ſhort, as theſe varieties would never have been produced but by a concurrence of external and accidental cauſes, as they would never have been confirmed and rendered permanent but by time, and by the continued action of theſe cauſes, ſo it is highly probable, that in time they would in like manner gradually diſappear, or even become different from what they at preſent are, if ſuch cauſes were no longer to ſubſiſt.

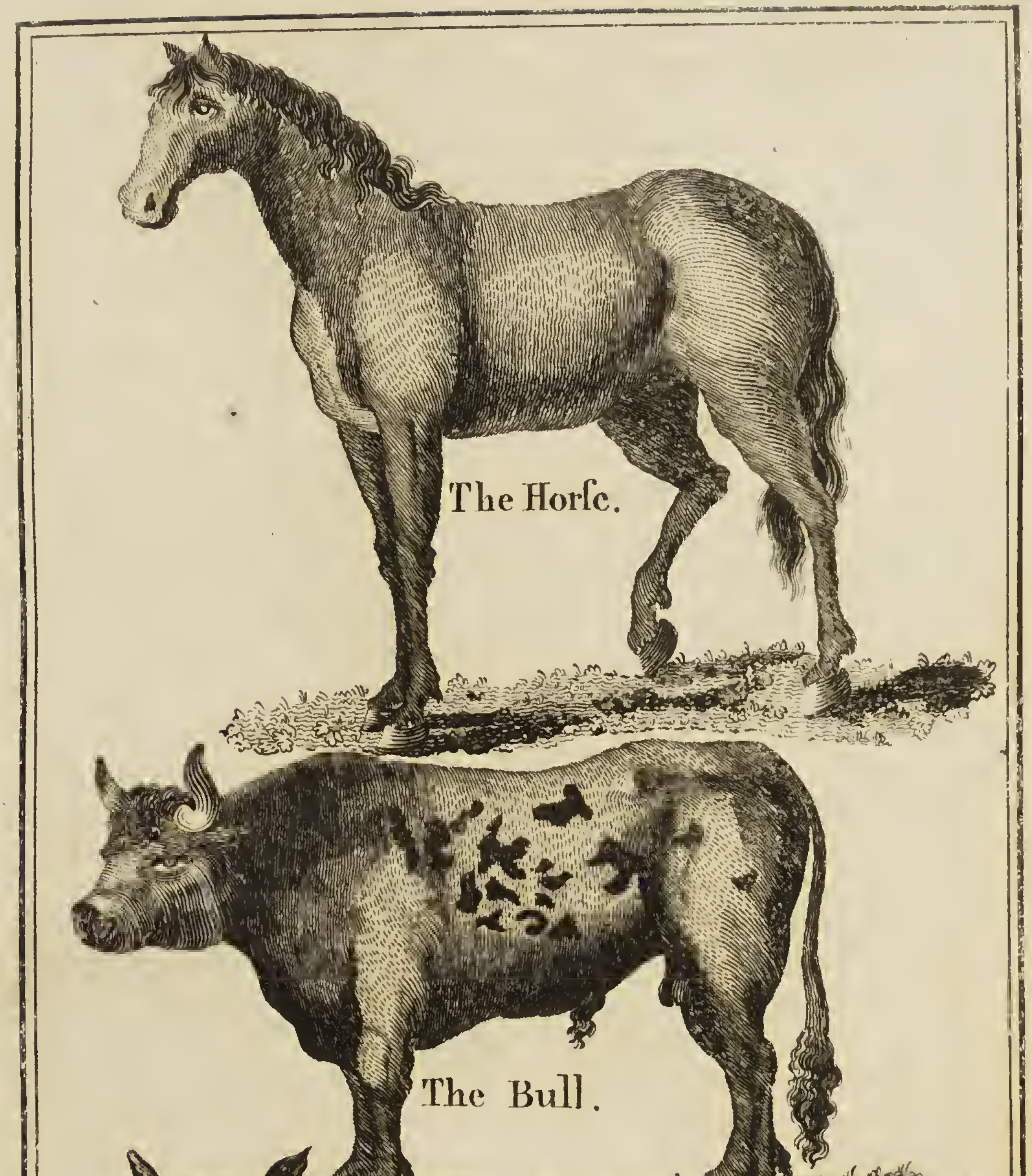
CHAP. VII.

OF DOMESTIC ANIMALS—THE HORSE—THE ASS—THE OX—THE SHEEP—THE GOAT—OF THE SWINE—THE WILD BOAR, &c.

The Horſe.

THE nobleſt conqueſt ever made by man, is that of this ſpirited animal, which ſhares with him the fatigues of war, and the glory of the combat. Equally intrepid as his maſter, the horſe ſees the danger, and braves it. Inſpired at the claſh of arms, he loves it, he ſeeks it, and is animated with the ſame ardour. He feels pleaſure alſo in the chace, in tournaments, in the courſe. He is all fire, but equally tractable

Plate I.


The Horſe.
The Bull.
The Aſs.

J. Fraſer ſc.

tractable as courageous, does not give way to his impetuoſity, and knows how to check his inclinations. He not only ſubmits to the arm which guides him, but even ſeems to conſult the deſires of his rider; and, always obedient to the impreſſions which he receives from him, preſſes on, moves gently, or ſtops, as his rider pleaſes. The horſe is a creature which renounces his being, to exiſt only by the will of another, which he even knows how to anticipate, and execute by the promptitude and exactneſs of his movements. He feels as much as we deſire, does only what we wiſh, gives himſelf up without reſerve, and refuſes nothing, makes uſe of all his ſtrength, exerts himſelf beyond it, and even dies to obey us.

Such is the horſe, whoſe natural qualities art has improved, which from the earlieſt ages has been broken to the ſervice of man. His education commences with the loſs of his liberty, and by conſtraint it is finiſhed. The ſervitude of theſe creatures is univerſal, and ſo ancient that we rarely ſee them in their natural ſtate. They are never wholly free from all their bands, not even at the time of reſt; and if they are ſometimes ſuffered to range at liberty in the fields, they always bear about them the marks of ſervitude, and frequently the cruel marks of labour and of pain. The mouth is deformed by the wrinkles occaſioned by the bit, the flanks ſcarred with wounds, inflicted by the ſpur, the hoofs are pierced by nails, and the attitude of the body conſtrained by habitual ſhackles. Even thoſe whoſe ſervitude is the moſt gentle, who are only fed and broken for luxury and magnificence, and whoſe golden chains ſerve leſs to decorate them, than to ſatisfy the vanity of their maſter, are ſtill more diſhonoured by the elegance of their trappings, by the treſſes of their manes, by the gold and ſilk with which they are covered, than by the iron ſhoes on their feet.

Nature is more beautiful than art, and in an animated being, the freedom of its movements makes nature beautiful. Obſerve the horſes in Spaniſh America, that live wild; their gait, their running, or their leaping, ſeem neither conſtrained nor regular. Proud of their independence, they fly the preſence of man, and diſdain his care. They wander about in liberty, in immenſe meads, where they feed on the freſh productions of an eternal ſpring. Deſtitute of any fixed habitation, without any other ſhelter than a mild ſky, they breathe a purer air than thoſe that are confined in vaulted palaces. Theſe wild horſes are alſo much ſtronger, much ſwifter, and more nervous than the greater part of domeſtic horſes. They have, what nature has beſtowed upon them, ſtrength and nobleneſs. The others, only what art can give, beauty and cunning.

The natural diſpoſition of theſe animals is not ferocious, for though ſuperior in ſtrength to the greateſt part of animals, they never attack them; and if they are attacked by others, they either diſdain them or trample them under their feet. They herd together, as they are not fearful of but fond of one another. As herbs and vegetables are ſufficient for their nouriſhment, they have quite enough to ſatisfy their appetite; and as they have no reliſh for the fleſh of animals, they never make war with them, nor with themſelves. They live in peace becauſe their appetite is ſimple and moderate; and, as they have enough, there is no room for envy.

As all parts of Europe are at preſent peopled, and almoſt equally inhabited, wild horſes are no longer ſound there; and thoſe which we ſee in America, were originally European tame horſes, which have multiplied in the vaſt deſarts of that country. The aſtoniſhment and fear which the inhabitants of Mexico and Peru expreſſed at the ſight of horſes and their riders, convinced the Spaniards that this animal was entirely unknown in theſe countries. They therefore carried thither a great number as well for ſervice, and their particular utility, as to propagate the breed. M. de la Salle, in 1685, ſaw in the northern parts of America, near the Bay of St Louis, whole troops of theſe wild horſes feeding in the paſtures, which were ſo fierce that nobody durſt approach them. The author of the Hiſtory of the Adventures of the Buccaneeres, ſays, that in the iſland of St Domingo, horſes may ſometimes be ſeen in troops of upwards of five hundred running together, and that as ſoon as they ſee a man, they will ſtop. He adds that one of them will approach to a certain diſtance, ſnort, take flight, and then all the reſt will follow him. To catch them, they make uſe of nooſes made of ropes, which they ſpread and hang in places which they know they frequent. If they are caught by the neck they ſtrangle themſelves, unleſs the huntſman haſtes to their aſſiſtance, who inſtantly ſecures them by the body and legs, and faſtens them to trees, where they are left for two days without either food or drink. This experiment is ſufficient to begin to make them tractable, and in time they become as much ſo as if they had never been wild; and even, if by chance they ever regain their liberty, they know their maſters, and ſuffer them to catch them again without trouble.

The manners of theſe animals almoſt wholly depend on their education. From time immemorial it has been the cuſtom to ſeparate the colts from their mothers after they have ſuckled them five, ſix, or ſeven months; for experience has taught that thoſe colts which are ſuckled ten or eleven months, are not of equal value with thoſe which are weaned ſooner, though they are generally fuller of fleſh. After ſix or ſeven months ſucking, they are weaned, that they may take more ſolid nouriſhment than milk. Bran is then given them twice a day, and a little hay, of which the quantity is increaſed in proportion as they advance in age, and they are kept in the ſtable as long as they ſeem to retain any deſire to return to the mare; but when this deſire ceaſes, they are ſuffered to go out in fine weather, and led to paſture. Care, however muſt be taken not to ſuffer them to go out to paſture faſting. They muſt have bran, and be made to drink an hour before they are ſuffered to graze, and are never to be expoſed to great cold or rain. In this manner they ſpend the firſt winter. In the May following, they are not only permitted to graze every day, but are ſuffered to lie in the fields all the ſummer, and even to the end of October, only they muſt not be allowed to eat the after-graſs; for if they accuſtom themſelves much to it, they will grow diſguſted with hay, which ought however to be their principal food, during the ſecond winter, together with bran mixed with barley, or oats wetted. They are managed in this manner, letting them graze in the day time during winter, and in the night alſo during the ſummer, till they are four years old, when they are taken from the paſtures, and fed on hay. This change in food requires ſome precaution; for the firſt eight days, the colt ſhould have nothing but ſtraw, and it is proper to adminiſter ſome vermifuge drinks, as thoſe inſects may have been generated from indigeſtion, and green food.

Great attention muſt be paid in weaning young colts, to put them into a proper ſtable, not too hot, for fear of rendering them too delicate and ſenſible to the impreſſions of the air. They ſhould frequently have freſh litter and be kept very clean, by rubbing them often down with a whiſp of ſtraw. But they ſhould not be tied up or curried till they are two years and a half, or three years old; for this gives them great pain, their ſkin being too delicate to bear it, and they would fall away inſtead of growing fat from it. Care too muſt be taken that the rack and manger are not very high, the neceſſity of raiſing their heads too high in order to reach their food, may poſſibly give a habit of carrying it in this faſhion, which would give them an aukward appearance.

At the age of three years, or three and a half, the rider ſhould begin to break them and make them tractable. They ſhould at firſt have a light eaſy ſaddle, and ought to wear it two or three hours every day, and they ſhould be accuſtomed to have a ſnaffle bit in their mouths, and to lift up their feet, on which they ſhould ſometimes receive rather ſmart ſtrokes, and if deſigned for coach or draught horſes, ſhould wear harneſs and a bridle. At firſt a curb ſhould not be uſed, they ſhould be held by a leather ſtrap, and be made to trot, on even ground, without a rider, and with only the ſaddle or harneſs on the body. When the ſaddle horſe turns eaſily, and willingly follows the perſon who holds the leather ſtrap, the rough rider ſhould mount him and diſmount again in the ſame place, without making him move, till he is four years old, becauſe, before that age, the weight of a man overloads him, but at four he ſhould be made to walk or trot, a little way at a time, with the rider on his back. When a coach horſe is accuſtomed to the harneſs, he ſhould be paired with a horſe that is thoroughly broke, putting on him a bridle, with a ſtrap paſſed through it, till he begins to be uſed to the draught. After this the coachman muſt teach him to back, having the aſſiſtance of a man before, who muſt puſh him gently back, and even give him ſome blows to make him do it. All this ſhould be done before young horſes have changed their food, for when once they are what is called corn-fed, that is, when they feed on grain and hay, as they are more vigorous, it is remarked alſo that they are leſs tractable, and more difficult to break.

The bit and the ſpur are two means made uſe of to bring them into ſubjection. The mouth does not appear formed by nature to receive any other impreſſions than that of taſte and appetite, there is, however, ſo great a ſenſibility in the mouth of a horſe, that in preference to the eyes and ears, we addreſs ourſelves to it, to make him underſtand our pleaſure. The ſmalleſt motions or preſſure of the bit, is ſufficient to inform and determine the animal; and this organ of ſenſe has no other fault than its perfection. Its too great ſenſibility muſt be managed, for if it is abuſed, the mouth of the horſe is rendered inſenſible to the impreſſion of the bit. The ſenſes of ſight, and hearing are not ſubject to ſuch a change, and could not be dulled in this manner; but, it has been found inconvenient to govern horſes by theſe organs, and it is generally true, that ſigns given them by the ſenſe of feeling have more effect on animals in general than thoſe conveyed by the eyes or ears.

Beſides, the ſituation of horſes with relation to thoſe who mount or conduct them, makes their eyes almoſt uſeleſs for this purpoſe, becauſe they ſee only ſtraight forwards. Hence they could only perceive the ſigns made to them when they turned their heads round; and although they are frequently conducted and animated by the ear, yet in fact, if they are well broken, the ſmalleſt preſſure of the thighs, or moſt trifling motion of the bit, is ſufficient to direct them. The ſpur is even uſeleſs, or at leaſt it is only made uſe of to force them to violent motions; and as through the unſkilfulneſs of the rider, it often happens that in giving the ſpur, he checks the bridle; the horſe finding himſelf excited on one ſide, and kept in on the other, only prances and capers without ſtirring out of his place.

By means of the bridle we teach horſes to hold up their heads, and place them in a proper manner, and the ſmalleſt ſign or movement of the rider is ſufficient to make the horſe ſhew all his different paces. The moſt natural is perhaps the trot, but pacing and galloping are more pleaſant for the rider, and theſe are the two paces we particularly endeavour to improve.

Though walking is the ſloweſt of all their paces, an horſe ſhould, notwithſtanding, ſtep quick, and neither take too long nor too ſhort ſteps. His carriage ſhould be eaſy, this eaſe depends much on the liberty of his ſhoulders, and is known by the manner in which he carries his head in walking. If he keep it high and ſteady, he is generally vigorous, quick, and free in his motions. When the motion of the ſhoulders is not free, the leg does not riſe enough, and the horſe is apt to ſtumble, and ſtrike his foot againſt the inequalities on the ground. When, on the other hand, the ſhoulders are more confined in their action, and the motion of the legs appears free, the horſe is ſoon fatigued, ſtumbles, and becomes uſeleſs. A horſe ſhould raiſe his ſhoulders, and his lower haunches in walking. He ſhould alſo ſupport his leg, and raiſe it high enough, but if he keep it up too long, or let it fall too ſlowly, he loſes all the advantage of his ſuppleneſs, and becomes quite heavy.

It is not ſufficient that his walk ſhould be eaſy, his ſteps muſt be alſo equal and uniform both behind and before, for if his buttocks have a ſwinging motion, whilſt he keeps up his ſhoulders, the rider is much jolted. The ſame thing happens when the horſe extends his hind leg too much, and reſts it almoſt in the ſame place in which he reſted his fore foot. Horſes with ſhort bodies are ſubject to this fault. Thoſe which croſs their legs or ſtrike them againſt each other, are not ſure footed. Thoſe again whoſe bodies are long, are the moſt eaſy for the rider, becauſe he is at a greater diſtance from the two centers of motion, the ſhoulders and haunches, and is therefore leſs ſenſible of the motion and jolting.

The uſual method of walking among quadrupedes, is to lift up one of the fore legs and one of the hind legs together. Whilſt the right fore leg is in motion, the left hind leg follows and advances at the ſame time, and this ſtep being made, the left fore leg conjointly with the right hind leg in its turn, and ſo on. As their bodies are ſupported upon four points of ſupport, which form a long ſquare, the eaſieſt manner of moving for them, is to change two of them at once in a diagonal line, in ſuch a manner, that the centre of gravity of the body of the animal, may move but little, and reſt always in the direction of the two points which are not in motion. In the three natural paces of the

the horſe, the walk, the trot, and the gallop, this rule of motion is always obſerved, but with ſome difference. In the walk, there are four times in the movement; if the right fore leg moves firſt, the left hind leg follows the moment after, then the left fore leg moves forward in turn, to be followed the inſtant after by the right hind leg. Thus the right fore foot reſts on the ground firſt, the left hind foot next, then the left fore foot reſts, and laſtly, the right hind foot, which makes a movement of four times, and at three intervals, of which, the firſt and laſt are ſhorter than the middle one. In the trot there are but two times in the movement; if the right fore leg goes off firſt, the left hind leg moves at the ſame time, and without any interval between the motion of the one, and the motion of the other. The left fore leg moves alſo at the ſame time with the right hind one.

In the gallop there is uſually three times; but as in this movement there is a kind of leaping, the interior parts of the horſe do not move of themſelves, but are driven away by the ſtrength of the haunches and the hinder parts. Thus, of the two fore legs, the right ought to advance more forward than the left. The left ought before hand to reſt on the ground to ſerve as a point of reſt for the ſudden jirk which he takes. Hence the left hind foot makes the firſt time of the movement, and reſts on the ground firſt; then the right hind leg is lifted up conjointly with the left fore leg, and reſt on the ground together. At length, the right fore leg, which is raiſed an inſtant after the left fore leg, and right hind one, reſts on the ground laſt, which makes the third time. Thus, in this movement of the gallop, there are three times and two intervals; and in the firſt of theſe intervals, when the movement is made with haſte, there is an inſtant when the four legs are in the air at the ſame time, and when the four ſhoes of the horſe may be ſeen at once. When the horſe has the haunches and the houghs ſupple, and moves them with agility, the movement of the gallop is more perfect, and the cadence is made in four times. He then reſts the left hind foot which ſhews the firſt time. When the right hind foot falls to the ground and ſhews the ſecond time. The left fore foot falls a moment after, ſhewing the third time; and at length the right fore foot, which reſts laſt, ſhews the fourth time.

Horſes uſually gallop on the right foot, in the ſame manner as they carry the fore right leg in walking and trotting. They alſo throw up the dirt in galloping with the right fore leg, which is more advanced than the left. The right hind leg which follows immediately the right fore one, is more advanced than the left hind leg, the whole time that the horſe continues to gallop. Hence the left leg which ſupports all the weight, and which forces forwards the others, is more tired; for this reaſon it would be right to exerciſe horſes in galloping alternately on the left foot, as well as on the right; and they would conſequently bear much longer this violent motion.

In walking, the legs of the horſe are lifted up ōnly a ſmall height, and the feet almoſt ſcrape the ground. In trotting they are raiſed higher, and the feet are entirely free from the ground. In galloping the legs are lifted up ſtill higher, and the feet ſeem to rebound from the earth. The walk to be good ſhould be quick, eaſy, light, and ſure. The trot ſhould be firm, quick, and equally ſuſtained. In this place, the horſe ſhould carry his head high, and his back ſtraight; for, if the haunches riſe and fall alternately at each trot he takes, if the crupper moves up and down, and the horſe rocks himſelf, he trots ill. If he throws out his fore legs, it is another fault: the fore legs ſhould tread in a line with the hind ones, which ſhould always efface their tracks. When one of the hind legs is thrown forwards, if the fore leg of the ſame ſide remain in its place too long, the motion becomes more uneaſy and difficult from this reſiſtance. For this reaſon the interval between the two times of the trot ſhould be ſhort; but, be it ever ſo ſhort, this reſiſtance is ſufficient to make this pace more uneaſy than walking and galloping, becauſe in walking the motion is more eaſy, gentle, and the reſiſtance leſs; and in galloping there is ſcarcely any horizontal reſiſtance, which is the only one inconvenient for the rider.

Walking, trotting, and galloping, are the moſt uſual natural paces. Some horſes, however, have another natural pace, called the amble, which is very different from the three others, and, at the firſt glance appears contrary to the laws of mechanics. In this pace the foot of the horſe grazes the ground ſtill more than in walking, and each ſtep is much longer. But the moſt remarkable circumſtance is, that the two legs on the ſame ſide, ſet off at the ſame time to make a ſtep, and afterwards the two other legs move at the ſame time to make another, ſo that each ſide of the body alternately is without ſupport, and there is no equilibrium maintained between the one or the other. It is therefore only from his almoſt grazing the earth, and the quick alternate motion, that he can ſupport himſelf in this pace. There is in the amble, as well as in the trot, but two times in the motion; and all the difference is, that in the trot the two legs which go together are oppoſite, in a diagonal line: inſtead of which, in the amble, the legs on the ſame ſide go together. This pace, is very eaſy for the rider, as it has not the jolting of the trot, which is occaſioned from the reſiſtance the fore leg meets with when the hind leg riſes. Becauſe in the amble, the fore leg riſes at the ſame time with the hind leg on the ſame ſide: inſtead of which, in trotting the fore leg on the ſame ſide, reſts and aſſiſts the impulſe during the whole time that the hind leg is in motion.

Of all the large animals, the horſe has the greateſt proportion and elegance in every part of the body. The great length of the jaws, is the principal cauſe of the difference between the heads of quadrupedes, and of the human ſpecies. It is alſo, the moſt ignoble mark of all; yet, though the jaws of the horſe are very long, he has not, like the aſs, an air of imbecility, or of ſtupidity like the ox. The regularity of the proportions of his head, on the contrary, gives him an air of ſprightlineſs, which is well ſupported by the beauty of his cheſt. The horſe ſeems deſirous of raiſing himſelf above his ſtate of a quadruped, by holding up his head, and in this noble attitude he looks man in his face. His eyes are lively and large, his ears well made, and of a juſt proportion, without being ſhort like thoſe of the bull, or too long like thoſe of the aſs. His mane ſuits well his head, ornaments his neck, and gives him an air of ſuperiority. His long buſhy tail covers, and terminates advantageouſly the extremities of his body, far different from the ſhort tails of the ſtag, the elephant, &c. and the naked tails of the aſs, the camel, the rhinoceros, &c. The tail of the horſe is formed of long, thick hair, which ſeems to come from his rump. He cannot raiſe his tail like the lion, but it ſuits him better hanging down, as he can move it ſideways. It is very uſeful to him to drive away the flies which incommode him, for though his ſkin is very hard, and is every where furniſhed with a cloſe thick coat it is extremely ſenſible.

The head of a well proportioned horſe ſhould be lean and ſmall, without being too long. The ears ſhould be at a moderate diſtance, ſmall, ſtraight, immoveable, narrow, thin, and well-placed on the top of the head. The forehead ſhould be narrow, and a little convex. Hollows ſhould be filled up, the eye-lids thin, the eyes clear, lively, full of fire, rather large, and projecting from the head, the pupil large, the nether jaw thin, the noſe a little aquiline, the noſtrils large and open, the partition of the noſe, and the lips thin. The mouth ought to be of a moderate width, the withers raiſed and ſlopping, the ſhoulders thin, flat, and not confined, the back equal, even, and inſenſibly arched lengthways, and raiſed on each ſide of the ſpine, which ſhould appear indented. Flanks ſhould be full and ſhort, the rump round and fleſhy, the haunches well covered with hair, the ſtump of the tail thick and firm, the fore legs and thighs thick and fleſhy, the knee round before, the houghs large and rounded, the ſinew looſe, the joint next the foot ſmall, the fetlock not thickly covered with hair. The paſtern ought to be large, and of a middling length, the coronet rather raiſed, the hoof black, ſmooth, ſhining, and high, the quarters round, the heels wide and moderately raiſed, the frog ſmall and thin, and the ſole thick and hollow.

But there are few horſes in which this aſſemblage of perfection is to be found. The eyes are ſubject to many complaints, which are ſometimes difficult to be known. In a healthy eye, we ought to ſee through the cornea two or three ſpots of the colour of ſoot, above the pupil. To ſee theſe ſpots, the cornea muſt be clear, clean, and tranſparent; if it appears double, or of a bad colour, the eye is not good. A ſmall, long, and ſtraight pupil, encompaſſed with a white circle, is alſo a bad ſign; and when it is of a blueiſh-green colour, the eye is certainly bad and the ſight dull.

I ſhall at preſent only add ſome remarks, from which, as well as from the preceding, a judgment may be formed of the principal perfections or imperfections of an horſe. It is very eaſy to judge of the natural and actual ſtate of the animal by the motion of his ears. When he walks, he ſhould project forwards the points of his ears. A jaded horſe carries his ears low; thoſe which are ſpirited and miſchievous, alternately carry one of their ears forwards and one backwards. They all carry their ears on that ſide from which they hear any noiſe, and when any one ſtrikes them on the back, or on the rump, they turn their ears back. Horſes which have the eyes deep ſunk in the head, or one ſmaller than the other, have uſually a bad ſight. Thoſe which have the mouth dry, are not of ſo healthy a temperament as thoſe which have the mouth moiſt, and make the bridle frothy. A ſaddle horſe ought to have the ſhoulders flat, moveable, and not very fleſhy. The draft horſe, on the contrary, ſhould have them flat, round, and brawny. If, notwithſtanding, the ſhoulders of a ſaddle horſe are too thin, it is a defect which ſhews the ſhoulders are not free, and conſequently the horſe cannot bear fatigue. Another fault of a ſaddle horſe is, to have the cheſt project too far forward, and the fore legs drawn too much back, becauſe he is apt to reſt on the hand in galloping, and even to ſtumble and fall. The length of the legs ſhould be proportionable to the height of the horſe; when the fore legs are too long he is not ſure footed, if they are too ſhort, he is too heavy in the hand. It is remarked that mares are more liable than horſes to be ſhort-legged, and that horſes in general have the legs thicker than mare or geldings.

The age of the horſe is known from his teeth. He has forty; twenty-four grinders, four eye teeth, and twelve inciſive teeth. Mares have no eye teeth, or if they have them they are very ſhort. The grinders are not inſtrumental to the knowledge of their age, we form our judgment from the front and eye teeth. The twelve front teeth begin to ſhew themſelves fifteen days after the birth of the foal, theſe firſt teeth are round, ſhort, weak, and drop out at different times in order to make room for others. At two years and a half the four front middle teeth drop out the firſt, two at top and two at bottom; a year after four others fall out, one on each ſide of thoſe which are already replaced. At about four years and a half, four others drop out, always on the ſide of thoſe which have been replaced, theſe four laſt milk teeth are replaced by four others, which do not grow near ſo faſt as theſe which replaced the firſt eight; and theſe four laſt teeth which are called the wedges, and which replace the four laſt milk teeth, are thoſe by which we know the age of an horſe. Theſe are eaſily known, ſince they are third as well at top as at bottom, beginning to count from the middle of the extremity of the jaw. Theſe teeth are hollow and have a black mark in their concavity. At four years and a half, or five years old, they ſcarcely project beyond the gums, and the hollow is plainly ſeen. At ſix and a half it begins to fill up, the mark alſo begins to diminiſh and grow narrower, and ſo continues till ſeven years and a half or eight years, when the hollow is entirely filled up and the black mark effaced. After the animal has attained eight years, as theſe teeth do not give further information of the age, we generally judge by the eye teeth or tuſks. Theſe four teeth are placed at the ſide of thoſe which I have juſt now taken notice of. The eye teeth, as well as the grinders, are not preceded by others which fall out, thoſe of the inferior jaw uſually come out firſt at three years and a half, and the two of the upper jaw at four years, and till they are ſix years old they are very ſharp. At ten years old the upper ones appear already blunt, worn and long, becauſe they are bare, the gum wearing away with age, and the more they are worn away the more aged the horſe is. From ten till thirteen or fourteen years, there is hardly any indication of the age, but then ſome hairs on the eye-brows begin to grow white; but this indication is equivocal, ſince it has been remarked that horſes engendered from old ſtallions and old mares have the hair white on the eye brows at ten years old. There are alſo horſes whoſe teeth are ſo hard that they do not wear, and upon which the black mark ſubſiſts, and is never effaced; and others which have the mark in the mouth as long as they live. We may alſo know, though with leſs preciſion, the age of a horſe by the ridges of the palate, which are effaced in proportion to his age.

It has been remarked, that ſtuds kept in dry and light countries produce good tempered, ſwift, and vigorous horſes, with nervous legs and hard hoofs; while on the other hand, thoſe which are bred in damp places, and in fat paſturage, have generally the head large and heavy, the legs thick, the hoofs ſoft, and the feet flat. This difference ariſes from the climate and food, but, what is more difficult to be accounted for, and what is ſtill more eſſential than any thing that has been ſaid, is, the neceſſity of always croſſing or mixing the breed, if we would prevent their degenerating.

Mares, uſually go with foal eleven months and ſome days; they will breed commonly to the age of fourteen or fifteen years and the more vigorous till they are above eighteen years.

The duration of the life of horſes, is like that of every other ſpecies of animals, in proportion to the length of the time of their growth. Man, who is above fourteen years in growing, lives ſix or ſeven times as long, that is ninety or a hundred years. The horſe, who attains his full growth in four years, lives ſix or ſeven times as long, that is twenty-five or thirty years. There are ſo few examples to contradict this rule, that we ſhould not even regard them as exceptions from which we may draw any precedents. It is worthy of remark too that as robuſt horſes arrive at their full growth in leſs time than delicate ones, they alſo live leſs time, and at fifteen years of age are old.

The Arabian horſes are the handſomeſt known in Europe, they are larger and plumper than thoſe of Barbary, and equally well-ſhaped, but as they are not often brought into this country, riding-maſters are not able to give an exact account of their perfections and defects.

The horſes of Barbary are more common. They are frequently negligent in their paces, and muſt be often reminded. They are very ſwift and ſtrong, light, and fit for hunting. Theſe horſes ſeem the moſt proper to breed from; it were only to be wiſhed that they were larger, as they ſeldom exceed four feet eight inches high.

The Turkiſh horſes are not ſo well-proportioned as thoſe of Barbary. They will, however, travel a great way, and are long winded. This is not ſurpriſing, if we conſider, that in warm countries, the bones of animals are harder than in cold climates; and it is for this reaſon, that they have more ſtrength in the legs.

The Spaniſh horſes, hold the ſecond rank after thoſe of Barbary. Thoſe of a handſome breed are plump, well-coated, and low. Their movements are likewiſe quick and ſupple, and they are remarkable for ſpirit and boldneſs. Their hair is uſually black, or of a bay cheſnut colour, though there are ſome of all colours, and it is but ſeldom that they have white legs and noſes. The Spaniards, who have an averſion to theſe marks, never breed from horſes that have them, chuſing only a ſtar in their forehead.

The handſomeſt Engliſh horſes have in their conformation great reſemblance to thoſe of Arabia and Barbary, from which they originally ſprung. They are frequently five feet high; and above. They are of all colours, and have all kinds of marks; they are generally ſtrong, vigorous, bold, capable of great fatigue, and excellent for hunting and courſing.

The horſes of Italy were formerly much handſomer than they are at preſent, becauſe the breed for ſome time has been neglected. Notwithſtanding this, there are ſtill ſome handſome Neapolitan horſes, eſpecially draught ones; but, in general, they have the head large, and the cheſt thick. They are untractable, and, conſequently, not eaſily managed; but theſe defects are compenſated by their noble form, their ſtatelineſs, and the beauty of their motions.

The Daniſh horſes are ſo handſome in their form, and ſo beautiful in their coats, that they are preferred to all others for putting into carriages. They are of all colours, and even of ſome ſingular ones, as pied. Horſes however ſpotted like tygers are found no where but in Denmark.

In Germany we meet with very handſome horſes; but they are generally heavy and ſhort-breathed. The Huſſars and Hungarians ſplit their noſtrils, in order, they ſay, to give them more breath, and alſo to hinder their neighing in battle. The Flemiſh horſes are greatly inferior to thoſe of Holland: they have almoſt all large heads, flat feet, and are ſubject to humours in the eyes; and theſe two laſt are eſſential defects in coach-horſes.

According to Marmol, the Arabian horſes are deſcended from the wild horſes of the deſarts of Arabia, of which, in ancient times, large ſtuds were formed, which have multiplied ſo much, that all Aſia and Africa are full of them. They are ſo nimble, that ſome will outſtrip the very oſtriches in their courſe. The Arabians of the deſart, and the people of Lybia, breed a great number of theſe horſes for hunting, but they neither uſe them in travelling nor in their wars; they ſend them to paſture whilſt there is graſs for them; and when that fails, they feed them only with dates and camel's milk, which make them nervous, nimble and lean. They lay ſnares for the wild horſes, and eat the fleſh of the young ones, which they affirm to be very delicate food. Theſe wild horſes are ſmaller than the tame ones, and are commonly aſh coloured, though there are alſo ſome white ones, and the mane and the hair of the tail is ſhort and frizzled.

Let an Arabian be ever ſo poor, he has horſes. They uſually mount the mares, experience having taught them that they bear fatigue, hunger, and thirſt, better than horſes. The Turks, on the contrary, do not approve of mares; and the Arabians ſell them the horſes which they do not keep for ſtallions. They have long preſerved, with great care, the breed of their horſes; they know all their genealogy, and diſtinguiſh the breeds by different names. The loweſt price for a mare of the firſt claſs, is from one hundred, to two or three hundred pounds ſterling. As the Arabians have only a tent for their houſe, it ſerves them alſo for a ſtable. The mare, colt, huſband, wife and children, lie promiſcuouſly together; and the little children will lie on the body and neck of the mare and colt, without being in the leaſt injured. Theſe mares are ſo accuſtomed to live in this familiarity, that they will ſuffer any kind of play. The Arabians treat them kindly, talk and reaſon with them, and take great care of them, always let them walk, and never uſe the ſpur without neceſſity. Hence, as ſoon as they feel their flank tickled with the ſtirrup-iron, they ſet out immediately with incredible ſwiftneſs, and leap hedges and ditches, with as much agility as ſo many does. But if their rider happen to fall, they are ſo well trained, that they will ſtop ſhort even in the moſt rapid gallop. All Arabian horſes are of a middling ſize, very eaſy in their manner, and rather thin than fat. They are dreſſed morning and evening regularly, with ſo much care, that not the ſmalleſt ſpot is left on their ſkins. Their legs, mane and tail, are alſo waſhed, which are let grow long, and ſeldom combed, to avoid breaking the hairs. They have nothing given them to eat all day, and ſeldom are allowed to drink above two or three times. At ſunſet, a bag is faſtened round their heads, in which is about half a buſhel of very clean barley. Theſe horſes, therefore, eat only during the night; and the bag is not taken from them till the next morning, when all is eaten up; and, in the month of March, when the graſs is tolerably high, they are turned out to paſture. As ſoon as the ſpring is paſt, they are taken again from paſture, and have neither graſs nor oats all the reſt of the year, and ſtraw but ſeldom, barley being their only food. They do not neglect to cut the mane of the colts as ſoon as they are a year or eighteen months old, in order to make it grow thick and long. They mount them at two years old, or two years and a half at moſt. Till this age they put neither ſaddle nor bridle on them; but after it, all the Arabian horſes ſtand ſaddled at the door of the tent, every day, from morning to night.

The breed of theſe horſes is diſperſed in Barbary, among the Moors, and even among the Negroes of the river Gambia and Senegal. The principal people of the country have ſome which are of uncommon beauty. Inſtead of barley or oats, they give them maize reduced to flour, which they mix with milk, when they are inclined to fatten them; and in this hot climate they ſeldom let them drink.

The Tartars live with their horſes nearly in the ſame manner as the Arabians do. When they are about ſeven or eight months old, the young children mount them, and make them walk and gallop a little way by turns. They thus break them by degrees, and oblige them to ſubmit to long faſtings; but they never mount them for racing or hunting till they are ſix or ſeven years old, and then make them ſupport incredible fatigue, ſuch as travelling two or three days together without ſtopping, paſſing four or five without any other food than a handful of graſs every eight hours. They alſo inure them to go twenty-four without drinking. Theſe horſes, which appear, and which are actually, ſo robuſt in their own country, become enfeebled and are ſoon good for nothing, when tranſported to China or the Indies; but they ſucceed better in Perſia and Turkey. In leſſer Tartary they have alſo a breed of ſmall horſes, which are in ſuch eſtimation, that they are not allowed to ſell them to foreigners. Theſe horſes have all the good and bad qualities of thoſe of great Tartary, which ſhews how much the ſame manners, and the ſame education, give the ſame diſpoſition to theſe animals. There are alſo in Circaſſia, and in Mingrelia, many horſes which are even handſomer than thoſe of Tartary. There are alſo found ſome handſome horſes in the Ukraine, Walachia, Poland and Sweden; but we have no particular account of their qualities and defects.

When the horſe is inflamed with love, deſire or appetite, he ſhews his teeth, and ſeems to laugh. He ſhews them alſo when he is angry, and would bite. He ſometimes puts out his tongue to lick, but leſs frequently than the ox, who licks much more than the horſe, and who, notwithſtanding, is leſs ſenſible to careſſes.

The horſe alſo remembers ill treatment much longer than the ox; his natural diſpoſition and courage are ſuch, that, when he finds more is expected from him than he is able to perform, he is irritated and will not exert himſelf. Inſtead of which, the ox, who is ſlow and idle, exerts himſelf, and is more eaſily tired.

The horſe ſleeps much leſs than man; for when he is in health, he does not reſt more than two or three hours together. He then gets up to eat; and when he is ſatisfied, he lies down a ſecond time; but he does not ſleep more than three or four hours in the twenty-four. There are even ſome horſes who never lie down, but ſleep ſtanding. It has alſo been remarked, that geldings ſleep oftener and longer than horſes.

Quadrupeds do not all drink in the ſame manner, though they are all equally obliged to ſeek with the head for the liquor, except the monkey, macaw, and ſome others that have hands, and conſequently drink like men, when a vaſe or glaſs is given them which they can hold. They carry this to their mouths, inclining the head, throwing down the liquor, and ſwallowing it by the ſimple motion of deglutition. Man uſually drinks in the ſame manner, becauſe it is moſt convenient. Moſt quadrupeds alſo chuſe that mode which is moſt agreeable to them, and conſtantly follow it. The dog, whoſe mouth is large, and whoſe tongue is long and thin, drinks lapping, which mode he prefers to that of wetting the noſe. The horſe, on the contrary, whoſe mouth is ſmall, and whoſe tongue is too ſhort and thick to ſcoop it up, and who always drinks with more avidity than he eats, dips the mouth and noſe quickly and deeply into the water, which he ſwallows largely by the ſimple motion of deglutition. This however forces him to drink without breathing; whilſt the dog breathes at his eaſe while he is drinking. Horſes therefore ſhould be ſuffered to take ſeveral draughts, eſpecially after running, when reſpiration is ſhort and quick. They ſhould not however, be ſuffered to drink the water too cold, becauſe that, independently of the cholic, which cold water frequently occaſions, it ſometimes happens alſo, from the neceſſity they are in of dipping the noſe into the water, that they catch cold, which often lays the foundation of a diſorder called the glanders, the moſt formidable of all to the horſe. As the ſeat of the glanders is in the pituitary membrane, it is conſequently a real cold, which occaſions an inflammation in this membrane. Travellers too, who give us a detail of the maladies of horſes in warm climates, as in Arabia, Perſia, and Barbary, do not ſay that the glanders are ſo frequent there as in cold climates. It is from this therefore that the conjecture ariſes, that this malady is occaſioned by the coldneſs of the water, becauſe theſe animals are obliged to dip and keep the noſe and noſtrils a conſiderable time under it. This, however, might be prevented by never giving it to them cold, and by always wiping the noſtrils after drinking. Aſſes, who fear the cold more than horſes, and who reſemble them ſo ſtrongly in the interior ſtructure, are, notwithſtanding, not ſo ſubject to the glanders. This may poſſibly happen from their drinking in a different manner from horſes; for, inſtead of dipping the mouth and noſe deeply into the water, they ſcarcely touch it with their lips.

I ſhall not ſpeak of the other diſeaſes of horſes. It would extend this Natural Hiſtory too much to join to the hiſtory of an animal that of its diſorders: nevertheleſs, I cannot leave the hiſtory of the horſe, without regretting that the health of this uſeful animal ſhould have been hitherto abandoned to the care, and too frequently abſurd practice, of ignorant people. The branch of phyſic which the ancients called Veterinarian, is at preſent ſcarcely known but by name. Were ſome phyſician to direct his views this way, and make this ſtudy his principal object, he would ſoon find it anſwer his purpoſe, both with reſpect to reputation and profit. Inſtead of degrading himſelf, he would render his name illuſtrious; and this branch of phyſic would not be ſo conjectural and difficult as the other. All cauſes being more ſimple in animals than in man, the diſeaſes ought alſo to be leſs complicated, and conſequently treated with more ſucceſs. Without mentioning the entire liberty he would have of making experiments and finding out new remedies, and the ability of arriving without fear or reproach at a great extent of knowledge of this kind, from which, by analogy, inferences might alſo be drawn ſalutary even to mankind.

The Aſs.

If we conſider this animal with attention, he appears only to be a horſe degenerated. The perfect ſimilitude in the conformation of the brain, the lungs, the ſtomach, the inteſtinal conduit, the heart, the liver, and other viſcera, and the great reſemblance of the body, legs, feet, end the entire ſkeleton, is a ſufficient foundation for this opinion. We may even attribute theſe ſlight differences which are found between theſe two animals, to the influence of the climate, food, and the fortuitous ſucceſſion of many generations of ſmall wild horſes, half degenerated, which, by little, have ſtill continued to degenerate ſo far as at laſt to produce a new and fixed ſpecies; or rather, a ſucceſſion of individuals, all vitiated in the ſame manner. What appears to favour this notion, is, that as horſes vary much more than aſſes in the colour of their ſkin, they are conſequently more anciently domeſtic, ſince all domeſtic animals vary much more in their colour than wild ones of the ſame ſpecies. Beſides the greater number of wild horſes, of which travellers ſpeak, are ſmall in their ſize, and have, like aſſes, the coat grey, and the tail naked and frizzled at the end. They alſo mention wild horſes, and even domeſtic ones, which have a black ſtripe on the back, and other marks, which nearly reſemble both wild and domeſtic aſſes.

Again if we conſider the difference of the temperament, diſpoſition, the manners, the organiſm, of theſe two animals, and, above all, the impoſſibility of mixing the breed to make one common ſpecies, or even an intermediate ſpecies which may be renewed, it appears a better-founded opinion, to think that theſe animals are of a ſpecies equally ancient, and originally as different as they are at preſent. The aſs differs materially from the horſe, in the ſmallneſs of the ſize, largeneſs of the head, length of the ears, hardneſs of the ſkin, nakedneſs of the tail, the form of the rump, and alſo in the dimenſions of the neighbouring parts; ſuch as the voice, the appetite, manner of drinking, &c. Do the horſe and the aſs, then, come originally from the ſame ſtock? are they of the ſame family, or not? and have they not always been different animals?

When two individuals cannot produce together, we can no otherwiſe account for it, but from ſlight difference in their temperament, or ſome accidental fault in the organs of generation, of one or the other of theſe two individuals. That two individuals of different ſpecies, ſhould produce other individuals which do not reſemble the one or the other in any fixed particular, and can conſequently produce nothing like themſelves, there needs but a certain degree of conformity between the form of the body and the organs of generation of theſe different animals. But what an immenſe number of combinations are neceſſary, even to ſuppoſe that two animals, male, and female, of a certain ſpecies, are no longer able to produce with thoſe of their own kind, but are even degenerated to ſuch a degree that they can only produce together; and alſo, what a prodigious immenſity of combinations are neceſſary that the production of theſe two degenerated animals ſhould follow exactly the ſame laws which are obſerved in the production of perfect animals; for a degenerated animal is itſelf a vitiated production; and how can a vitiated, depraved origin, become a ſtock, and not only produce a conſtant ſucceſſion of beings, but even produce them in the ſame manner, and following the ſame laws, which in effect reproduce the animal, the origin of which is pure?

Although we cannot demonſtrate that the production of a ſpecies, by degeneration, is a thing impoſſible in nature, yet the number of probabilities on the contrary is ſo great, that we can no longer doubt of it. For if ſome ſpecies have been produced by the degeneration of others, if the ſpecies of the aſs is derived from the ſpecies of the horſe, this can only have happened ſucceſſively. By degrees, therefore, there would have been, between the horſe and the aſs, a great number of intermediate animals, the firſt of which would have differed but ſlightly in its nature from the horſe, and the latter would have approached by degrees to that of the aſs. Why then do we not ſee the repreſentatives, the deſcendants of the intermediate ſpecies? why do only the two extremes remain?

The aſs is then an aſs, and not a horſe degenerated. He is neither a ſtranger, an intruder, nor a baſtard. He has, his family, his ſpecies, and his rank. His blood is pure; and although his nobility is leſs illuſtrious, yet it is equally good, equally ancient with that of the horſe. Why, then, have we ſo much contempt for this animal; ſo good, ſo patient, ſo ſteady, ſo uſeful? Do men carry their contempt even to animals, thoſe which ſerve them ſo well, and at ſo ſmall an expence? We take care of, we inſtruct, and we exerciſe the horſe, whilſt the aſs is abandoned to the care of the loweſt ſervant, or the tricks of children. Thus inſtead of improving, he muſt looſe by his education; and if there were not a fund of good qualities, he would certainly loſe them by the manner in which he is treated. He is the May game of the ruſticks, who beat him with ſtaffs, overload him, and make him work beyond his ſtrength. We do not conſider, that he would be the moſt beautiful, the beſt-formed, and moſt diſtinguiſhed of the lower animals, if there were no horſe in the world. We forget that he is an aſs, that he has all the qualities of his nature, all the gifts attached to his ſpecies; and at the ſame time, we only think of the figure and qualities of the horſe, which he ought not to have.

He is naturally as humble, patient, and quiet, as the horſe is proud, ardent, and impetuous. He ſuffers with conſtancy, and perhaps with courage, chaſtiſement and blows. He is moderate both as to the quantity and quality of his food. He is contented with the hardeſt and moſt diſagreeable herbs, which the horſe, and other animals, will leave with diſdain. He is very delicate with reſpect to his water, for he will drink none but the cleareſt, and from rivulets which he is acquainted with.

He drinks as moderately as he eats, and does not put his noſe in the water (through fear, as ſome ſay, of the ſhadow of his ears.) As care is not taken to curry-comb him, he frequently rolls himſelf on the graſs, thiſtles, and in the duſt; and, without regarding his load, he lays himſelf down to roll about as often as he can, and by this ſeems to reproach his maſter, for the little care he takes of him.

In his earlieſt youth, he is ſprightly, and even handſome, light and genteel; but, either from age or bad treatment, he ſoon loſes it, and becomes ſlow, indocile and headſtrong. Pliny aſſures us, that, when they ſeperate the mother from the young one, ſhe will go through fire to recover it. The aſs is alſo ſtrongly attached to his maſter, notwithſtanding he is uſually ill-treated. He will ſmell him afar off, and can diſtinguiſh him from all other men. He alſo knows the places where he has lived, and the ways which he has frequented. His eyes are good, and his ſmell is acute. His ears are excellent, which has alſo contributed to his being numbered among timid animals, which it is pretended have all the hearing extremely delicate, and the ears long. When he is overloaded, he ſhews it by lowering his head, and bending down his ears: when he is greatly abuſed, he opens his mouth, and draws back his lips in a moſt diſagreeable manner, which gives him an air of deriſion and ſcorn. If his eyes are covered over, he remains motionleſs. He walks, trots, and gallops like the horſe; but all his motions are ſmaller, and much ſlower. Notwithſtanding he can run with tolerable ſwiftneſs, he can gallop but a little way, and whatever paces he uſes, if he is hard preſſed, he is ſoon fatigued.

The Jack-aſs brays in a very diſcordant manner. The ſhe-aſs has a clearer and ſhriller voice. Thoſe that are gelded, bray very low; and, though they ſeem to make the ſame efforts, and the ſame motions of the throat, yet their cry cannot be heard far off.

Of all the animals covered with hair, the aſs is leaſt ſubject to vermin. This circumſtance may be attributed to the hardneſs and dryneſs of the ſkin, which is certainly harder than in the greateſt part of other quadrupeds. He is much leſs ſenſible than the horſe too to the whip and the ſting of the flies.

At two years and a half old, the firſt middle inciſive teeth fall out, and afterwards the other inciſive at the ſide of the firſt fall alſo, and are renewed at the ſame time and in the ſame order as thoſe of the horſe. The age of the aſs is alſo known by his teeth. The third inciſive on each ſide aſcertains it, as in the horſe.

The aſs is three or four years in growing, and lives twenty-five or thirty years. He ſleeps leſs than the horſe, and does not lie down to ſleep, except when quite tired.

There are among aſſes different races, as among horſes; but they are much leſs known, becauſe they have not been reared with the ſame attention; but we cannot doubt that they came all originally from warm climates. Ariſtotle aſſures us, that there were none in his time in Scythia, nor in the other neighbouring countries nor even in Gaul, which, he ſays, is a cold climate. He adds too that a cold climate either prevents them from procreating their ſpecies, or makes them to degenerate; and that this laſt circumſtance is the reaſon that they are ſmall and weak in Illyria, Thrace and Epirus. They appear to have come originally from Arabia, and to have paſſed from Arabia into Egypt, from Egypt into Greece, from Greece into Italy, from Italy into France, and afterwards into Germany, England, and laſtly into Sweden, &c. for they are, in fact, weak and ſmall in proportion to the coldneſs of the climate.

The Latins, after the Greeks, have called the wild aſs, angra; which animal muſt not be confounded, as ſome naturaliſts and many travellers have done, with the zebra. The angra, or wild aſs, is not ſtriped like the zebra, and is not near ſo elegant in figure. Wild aſſes are found in ſome of the iſlands of the Archipelago, and particularly in that of Cerigo. There are alſo many in the deſarts of Lybia and Numidia. They are grey, and run ſo faſt, that the horſes of Barbary only outſtrip them in the chace. When they ſee a man, they give a loud cry, turn themſelves about, and ſtop, and do not attempt to fly till he approaches pretty near them. They are taken in ſnares made with ropes, and go in troops both to paſturage and to drink; their fleſh is alſo eaten. There were alſo, in the time of Marmol, wild aſſes in the iſland of Sardinia, but leſs than thoſe of Africa; and Pietro della Valle ſaid, he has ſeen a wild aſs at Baſſora, whoſe figure differed in no reſpect from a domeſtic one. He was only of a lighter colour, and had, from the head to the tail, a ſtripe of white; he was alſo much livelier, and lighter in hunting, than the greater number of aſſes.

Neither aſſes nor horſes have been found in America, although the climate, eſpecially of North America, is as good for them as any other. Thoſe which the Spaniards have tranſported from Europe, and which they have left in the Weſt-Indies, and on the Continent, have greatly multiplied; and in ſome parts wild aſſes are found in troops, and are taken in ſnares like wild horſes.

The aſs with the mare produces large mules, and the horſe with the ſhe-aſs produces ſmall mules, differing from the firſt in many reſpects.

As wild aſſes are unknown in theſe climates, we cannot actually ſay whether the fleſh is good to eat; but it is certain, that the fleſh of the domeſtic aſs is extremely bad, and harder than that of the horſe. The milk of the aſs, on the contrary, is an approved and ſpecific remedy for certain complaints, and its uſe is known from the Greeks to us. That it may be good in its kind, we ſhould chuſe a young healthy ſhe-aſs, full of fleſh, that has lately foaled, and which has not ſince that period been with the male. Care muſt be taken to feed her well with hay, wheat, and graſs. The milk muſt not be expoſed to the air, which will ſpoil it in a ſhort while.

The ſkin of the aſs is uſed for different purpoſes, ſuch as to make drums, ſhoes, and thick parchment for pocket-books, which is ſlightly varniſhed over. It is alſo with the ſkins of aſſes that the Orientals make the ſagri, which we call ſhagreen.

The aſs is, perhaps, the animal which can carry the greateſt weight. As it coſts but little to feed him, and as he ſcarcely requires any care, he is of great uſe in the country. He alſo ſerves to ride on, as all his paces are gentle, and he ſtumbles leſs than the horſe. He is frequently put to the plough in countries where the earth is light, and his dung is an excellent manure.

*The Ox.**

The ox, and other herbiverous animals are not only the moſt uſeful to man, but they are alſo maintained at the leaſt expence. The ox is the moſt excellent in this reſpect, for he reſtores as much to the earth as he takes from it, and even enriches the ground on which he feeds.

That the ox is not ſo proper as the horſe, the aſs, and the camel, for carrying burthens, the form of his back and loins, is a demonſtration. But the thickneſs of his neck, and the broadneſs of his ſhoulders point him out as deſtined for the yoke.

In ſome places they make him draw by the horns. In ſupport of this practice, it is alledged that when yoked in this manner he is more eaſily managed. His head is very ſtrong, and he draws well by the horns, but with much leſs advantage than by the ſhoulders. Nature ſeems to have deſtined him for the plough. The ſize of his body, the ſlowneſs of his motions, the ſhortneſs of his legs, and even his tranquillity and patience when he labours, ſeem to concur in rendering him proper for the cultivation of the fields, and more capable than any other of overcoming the conſtant reſiſtance that the earth oppoſes to his efforts.

In thoſe ſpecies of animals, which man has formed into flocks, and where the multiplication is the principal object, the female is more uſeful than the male. The produce of the cow is renewed every inſtant. The fleſh of the calf is wholeſome and delicate. The milk is the food of children; butter reliſhes the moſt of our diſhes, and cheeſe is the common food of the peaſants.

The cow arrives at the age of puberty in eighteen months, and the bull in two years. But they ſhould not be admitted to each other till they be three years old. From three to nine years theſe animals are in their greateſt vigour. After this, neither cows nor bulls are fit for any thing but to fatten for the ſlaughter, as at two years of age they are almoſt at their full growth. The length of their lives is alſo, like that of the greateſt part of the other ſpecies of animals, about fourteen years, and they ſeldom live above fifteen.

The dulleſt and moſt idle animals are not thoſe which ſleep the ſoundeſt, or the longeſt. The ox ſleeps, but his ſleep is ſhort, and not very ſound; for he awakes at the leaſt noiſe. He uſually lies on his left ſide, and that kidney is always larger and fatter than the kidney on the right ſide.

Oxen like other domeſtic animals, differ in colour; but at the ſame time red appears to be the moſt common, and the redder they are, the more they are eſteemed. It is ſaid, that oxen of a bay colour laſt longeſt; that thoſe of a brown colour are ſooner fatigued, and ſhorter lived; that the grey, brindled, and white are not proper for work, and are only fit to be fatted for ſlaughter. But whatever colour the coat of the ox is of, it ſhould be ſhining, thick, and ſoft to the touch; for if it is rough and uneven, we have reaſon to think that the animal is not well, or at leaſt, that he is not of a ſtrong conſtitution.

The ox ſhould only be worked from three years old to ten; and it is proper then to take him from the plough, in order to fatten and ſell him, as the fleſh will be better than if he be kept longer. The age of this animal is known by his teeth and horns. The firſt front teeth fall out when he is ten months old, and are replaced by others which are larger and not ſo white. At ſixteen months thoſe on each ſide of the middle teeth drop out, and are replaced by others; and at three years old, all the inciſive teeth are renewed. They are then all long, white, and even; and, in proportion as the ox advances in years, they decay, and become unequal and black. The horns fall off at three years, and theſe are replaced by other horns, which, like the ſecond teeth, do not fall off a ſecond time. Thoſe of the ox and the cow grow larger and longer than thoſe of the bull; but the growth of theſe ſecond horns is not uniform. The fourth year of the age of the ox, two little pointed horns ſprout, which are even, and terminate at the head by a kind of knob. The following year this knob grows from the head, puſhed out by a cylinder of horn, which forms and terminates alſo by another knob; for as long as the animal lives, the horns grow. Theſe knobs become annular knobs, which are eaſily to be diſtinguiſhed in the horns, and by which alſo the age may be eaſily known, by reckoning three years for the firſt knob next the point of the horn, and one year more for each of the intervals between the other knobs.

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* The word Ox, in its common acceptation, denotes Black Cattle in general without regard to ſex. In a more reſtricted ſenſe, it ſignifies a caſtrated Bull.

The horſe eats night and day, ſlowly, but almoſt continually. The ox, on the contrary, eats quick, and takes in a ſhort time all the food which he requires; after which he ceaſes to eat, and lies down to ruminate. This difference ariſes from the different conformation of the ſtomachs of theſe animals. The ox, of whoſe ſtomachs the two firſt form but one bag of a vaſt capacity, can in both of them, receive graſs, at the ſame time which it afterwards ruminates and digeſts at leiſure. The horſe, whoſe ſtomach is ſmall, and can receive but a ſmall quantity of graſs, is filled ſucceſſively in proportion as he digeſts it, and it paſſes into the inteſtines, where the principal decompoſition of the food is performed.

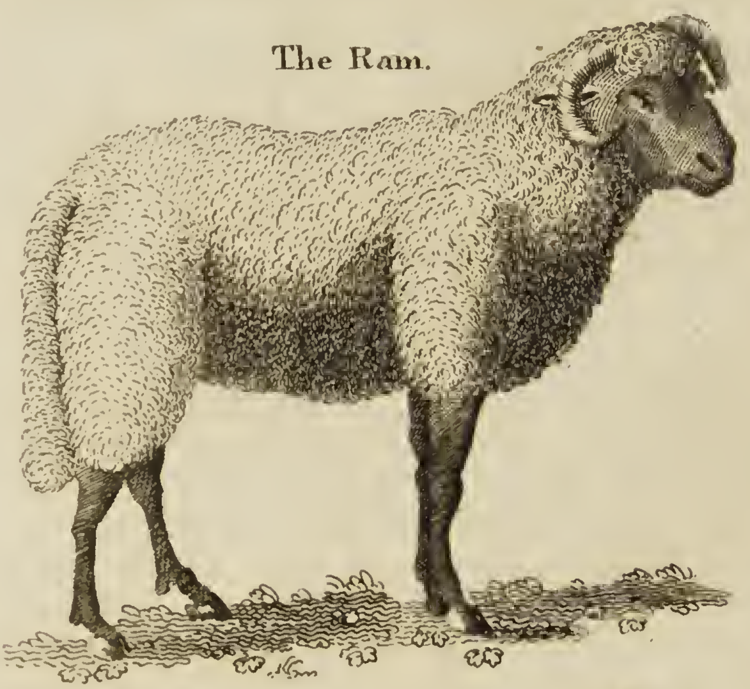
Chewing the cud is but a vomiting without ſtraining, occaſioned by the re-action of the firſt ſtomach on the food which it contains. The ox fills the two firſt ſtomachs, the paunch, and the bag, which is but a portion of the paunch, as much as he can. This membrane acts with force on the graſs which it contains; it is chewed but a little, and its quantity is greatly increaſed by fermentation. Were the food liquid, this force of contraction would occaſion it to paſs by the third ſtomach, which only communicates with the other by a narrow conveyance, and cannot admit ſuch dry food, or, at leaſt, can only admit the moiſter parts. The food muſt, therefore, neceſſarily paſs up again into the œſophagus, the orifice of which is larger than the orifice of the conduit, and the animal again chews and macerates them, imbibes them afreſh with its ſaliva, and thus by degrees makes the aliment more moiſt. He reduces it to a paſte, liquid enough for it to enter this conduit which paſſes into the third ſtomach, where it is again macerated before it enters the fourth; and it is in this laſt ſtomach that the decompoſition of the hay is finiſhed, which is reduced to a perfect mucilage.

What chiefly confirms the truth of this explication, is, that as long as the animals ſuck, and are fed with milk and other liquid aliments, they do not chew the cud. They chew the cud much more too in winter, when they are fed with dry food, than in ſummer, when they eat tender graſs.

Good

Plate 2.

The Ram.



The Sheep.

The Fox.

J. Fraser sc.

Good milk is neither too thick, nor too thin. Its conſiſtence ſhould be ſuch, that when we take a drop, it ſhould preſerve its roundneſs without running, and in colour it ſhould be of a beautiful white. That which is inclinable to blue or yellow is not good. Its taſte ſhould be ſweet, without any bitterneſs or ſourneſs. It is better during the month of May, and during the ſummer, than in the winter; and it is never perfectly good but when the cow is of a proper age, and in good health. The milk of young cows is too thick, that of old ones during the winter is alſo too thick. The milk of cows which are hot, is not good, any more than that of a cow which is near her time, or which has lately calved. In the third and fourth ſtomach of the calf which ſucks, there are clots of crudled milk. Theſe when dried in the air, ſerve to make runnet or that well known ſubſtance which coagulates milk. The longer the runnet is kept, the better it is, and it requires but a ſmall quantity of it to make a great deal of cheeſe.

Bulls, cows, and oxen, are apt to lick themſelves, but moſtly when they are quiet; and as it is thought that it hinders them from fattening, it is uſual to rub all the parts of their bodies they can touch with their dung. When this precaution is not taken, they raiſe up the hair of their coats with their tongues, which are very rough, and they ſwallow this hair in large quantities. As this ſubſtance cannot digeſt, it remains in the ſtomach, and forms round, ſmooth balls, which are ſometimes of ſo conſiderable a ſize, as to prevent their digeſtion. Theſe knobs in time get covered with a brown cruſt, which is ſomewhat hard. It is, notwithſtanding, but a thick mucilage, which, by rubbing and co-action becomes hard and ſhining. It is never found any where but in the paunch, and if any of the hair gets into the other ſtomachs, it does not remain but ſeems to paſs with the aliments.

Animals which have inciſive teeth, ſuch as the horſe and the aſs, in both jaws, bite ſhort graſs more eaſily than thoſe which want inciſive teeth in the upper jaw. Hence if the ſheep and the goat bite the cloſeſt, it is becauſe they are ſmall, and their lips are thin. But the ox, whoſe lips are thick, can only bite long graſs; and it is for this reaſon that they do no harm to the paſture on which they live, as they can only bite off the tops of the young graſs. They do not ſtir the roots, and for this reaſon ſcarcely hurt the growth; inſtead of which, the ſheep and the goat bite ſo cloſe, that they deſtroy the ſtalk and ſpoil the root. Beſides, the horſe chuſes the moſt delicate graſs, and leaves the largeſt to grow, the ſtalks of which are hard. The ox, on the other hand, bites theſe thick ſtalks, and by little and little deſtroys the coarſe graſs; ſo that, at the end of ſome years, the field in which the horſe has lived becomes a very bad one, whilſt that on which the ox has brouſed, becomes fine paſture.

The Sheep.

We can no longer doubt, but that animals which are actually domeſtic, were formerly wild. But man, who has conquered ſo many millions, of individuals, can he boaſt of having conquered an entire ſpecies? As they were all created without his aid, may he not alſo believe, that they all have had orders to grow without his help? If we conſider, nevertheleſs, the weakneſs and ſtupidity of the ſheep, and at the ſame time reflect, that this animal, without defence, cannot find ſafety in flight; that he has for his enemies all devouring animals, which ſeem to ſeek him in preference to any other; that formerly this ſpecies produced but few; that each individual lived but a ſhort time; we ſhall be inclined to think, that from the beginning, ſheep were intruſted to the care of man. What ſeems to give farther ſtrength to this opinion is, that there are no wild ſheep in the deſarts; that in all places where man does not rule, the lion, the tiger, and the wolf reign by force, and by cruelty; and theſe animals of blood and carnage, all live longer, and multiply much more than ſheep; and, in ſhort, that if we were now to abandon the troops of theſe ſpecies, which we have rendered ſo numerous, they would ſoon be deſtroyed before our eyes, and the ſpecies would be entirely annihilated by the voraciouſneſs of its numberleſs ſpecies of enemies.

The ſheep is indeed abſolutely without reſource, and without defence. The ram has but feeble arms; his courage is nothing but a petulance uſeleſs to himſelf, inconvenient to others, and which is deſtroyed by caſtration. The weather ſheep are ſtill more fearful than ews; it is through fear that they muſter up ſo often in troops. The ſmalleſt noiſe, to which they are unaccuſtomed, is ſufficient to make them fly, and get cloſe together. This fear is attended with the greateſt ſtupidity; for they know not how to fly the danger, nor do they even ſeem to feel the inconvenience of their ſituation. They continue wherever they are, either in rain or ſnow, whence they will not ſtir; and to oblige them to change their ſituation, they muſt have a chief, who is intruſted to walk firſt, and whom they will follow, ſtep by ſtep. This chief will remain with the reſt of the flock, without motion, in the ſame place, if he were not driven from it by the ſhepherd, or the dog which guards them, who, in fact, watches for their ſafety, defends, directs, and ſeparates them, aſſembles them together, and communicates to them motions not their own. Goats, which in many things reſemble ſheep, have much more underſtanding.

But this animal, ſo cowardly in itſelf, ſo deſtitute in ſentiment, is the moſt precious and the moſt uſeful, of animals both for the preſent, and future ſupport of man. Of itſelf, it not only ſupplies our greateſt neceſſities, but, at the ſame time furniſhes us both with food and cloathing. Without enumerating the particular advantages we have from the milk; the ſkin, and, even the bowels, and bones, and the dung of this animal evince that nature has given it nothing but what is uſeful to man.

Theſe ſimple animals, are alſo of a very weak conſtitution; for they cannot walk long; travelling weakens and exhauſts them; and when they run, they pant, and are ſoon out of breath. The great heat of the ſun is as diſagreeable to them, as too much moiſture, cold and ſnow. They are ſubject to many diſorders, the greateſt part of which are contagious; too much fat ſometimes kills them, and always prevents them from having young ones. They ſuffer a great deal in having young, have frequent abortions, and require more care than any other domeſtic animal.

At one year old, the ſheep loſe the two front teeth of the lower jaw; and almoſt every one knows that they have no inciſive teeth in the upper jaw. At eighteen months old, the two neighbouring teeth of the two firſt that fell, fall alſo; and, at three years old, they are replaced. They are then even, and tolerably white; but, in proportion as the animal becomes older, they become uneven and black. The age of the ram is alſo known by his horns, which ſhew themſelves in the firſt year, and frequently from the birth. They grow every year a ring, which is a mark round. The ſheep have generally no horns; but they have boney prominences on their heads, in the ſame part where the horns of the rams grow; there are, notwithſtanding, ſome ſheep which have two, and even four horns. Theſe ſheep are like the others; their horns are five or ſix inches long, but leſs turned than thoſe of the ram; and when there are four horns, the two exterior ones are ſhorter than the two others.

Sheep carry their young five months, and drop them at the beginning of the ſixth. They uſually produce but one lamb, and ſometimes two. In warm climates they may produce twice a year, but in cold climates they produce but once a year.

The ſheep has great plenty of milk for five or ſix months. This milk is tolerable food for children, and for poor people in the country; and they make good cheeſe with it, eſpecially when it is mixed with cow's milk.

In dry ſoils, and in high grounds, where wild thyme and other odoriferous herbs abound, the fleſh of the ſheep is of a much better quality than when it is fed in low plains and humid valleys, unleſs theſe plains are ſandy and near the ſea; for then all the herbs imbibe a ſaltneſs, and the fleſh of mutton is no where ſo good as in theſe ſalt meadows. The ſheep's milk is alſo more abundant, and of a better flavour, as nothing is more pleaſing to the taſte of theſe animals than ſalt, nothing is more ſalutary for them, when it is given them in moderation; and in ſome places, they put into the ſheep-pen a bag of ſalt, or a ſalt ſtone, which they will lick by turns.

Nothing contributes more to fatten ſheep, than to give them water in great quantity; and nothing prevents this advantage ſo much as the heat of the ſun.

We frequently find worms in the livers of animals; and in the Journal des Savans, there is a deſcription of worms found in the livers of ſheep and oxen, as alſo in the German Ephemerides. One would think that theſe ſingular worms were only found in the livers of animals which chew the cud; but Mr Daubenton has found ſome, which exactly reſemble them, in the liver of the aſs; and it is probable that they may be found in the livers of other animals. It has alſo been ſaid, that butterflies have been found in the livers of ſheep.

The operation of ſheep-ſhearing is performed once a year. In France it is performed in the month of May, after the ſheep have been well waſhed, in order to make the wool as clean as poſſible. In April it would be too cold; and if they were to wait till the months of June and July, there would not be time enough for the wool to grow during the ſummer, to preſerve them from the cold in the winter. The wool of ewes is generally better, and in greater abundance, than that of ſheep. That on the neck, and the top of the back, is the beſt. White wool is preferable to grey, brown, or black, becauſe in dying it will take any colour. For the quality, that which is ſmooth is better than that which is frizzled; it is alſo ſaid, that ſheep whoſe wool is frizzled, are not ſo healthy as others. Another conſiderable advantage may be made of ſheep, by incloſing them on the ground we wiſh to improve. The dung, the urine, and the heat of the bodies of theſe animals, will, in a little time, enrich the moſt exhauſted, cold, and infertile ground. A hundred ſheep, in one ſummer, will enrich eight acres of land for ſix years.

The ancients have ſaid, that all animals which chew the cud, have tallow; but this is only true of the ſheep and the goat; and that of the goat is more abundant, whiter, drier, firmer, and of a better quality than any other. It is for the moſt part about the loins that this ſuet is amaſſed in the greateſt quantities, and the left loin has always a larger quantity than the right. Sheep have no other fat about them but ſuet; and this matter is ſo predominent in their habit, that all the extremities of the body are edged with it; even the blood contains a conſiderable quantity.

The wool of Italy, Spain and England, is finer than that of France.

Thoſe animals with large, long tails, which are ſo common in Africa and Aſia, and to which travellers have given the name of Barbary ſheep, appear to be of a different ſpecies from our ſheep, as well as the lamb of America.

The Goat.

Though the ſpecies of animals are ſeparated from each other; yet ſome ſpecies approach ſo near to others, that ſpace is only left for a bare line of diſtinction. The aſs might almoſt replace the horſe; and, if the ſpecies of ſheep were to fail, that of the goat might ſupply the loſs. The goat like the ſheep, affords both milk and ſuet in conſiderable quantities. Her hair, though rougher than wool, ſerves, however, to make very good ſtuffs; and her ſkin is worth more than the ſkin of the ſheep. The fleſh of the young goat alſo nearly reſembles that of the lamb. Theſe auxiliary ſpecies are wilder and more robuſt than the principal ſpecies. The aſs and the goat do not require ſo much care as the horſe and the ſheep; for they every where find food to ſupport them, and brouze equally on plants of all kinds. They are leſs affected with the intemperance of the climate, and can do better without the help of man. The leſs dependence they have on us, the more they ſeem to belong to nature.

Although the goat is a diſtinct ſpecies, yet he will couple with the ſheep; but no intermediate ſpecies has been introduced between the goat and the ſheep. Theſe two ſpecies are diſtinct, remaining conſtantly ſeparated, and always at the ſame diſtance from each other, and have never been changed by this mixture, or produced any new ſtock, or new breed of intermediate animals. They have, at moſt, only produced different individuals, which has no influence on the unity of each primitive ſpecies, and which, on the contrary, confirms the truth of their different characteriſtics.

The goat has naturally more underſtanding, and can ſhift better for herſelf than the ſheep. She comes voluntarily, and is eaſily familiariſed: ſhe is ſenſible of careſſes, and capable of attachment: ſhe is alſo ſtronger, lighter, more agile, and leſs timid than the ſheep: ſhe is lively, capricious and laſcivious.

Goats are fond of ſtraying in ſolitary places, of climbing up ſteep places, of ſleeping on the tops of rocks, and on the brink of precipices.

The inconſtancy of this animal's nature is ſhewn by the irregularity of her actions; ſhe walks, ſtops ſhort, runs, jumps, advances, retreats, ſhews, then hides herſelf, or flies, and this all from caprice, or without any

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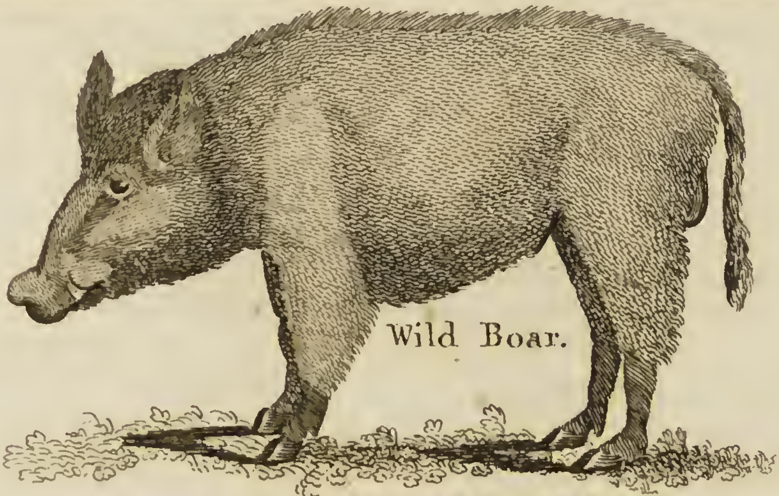
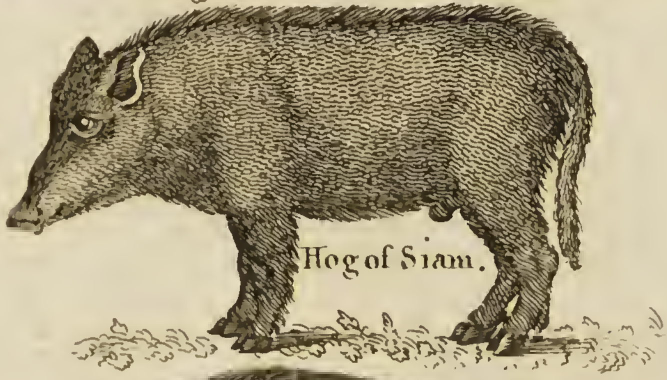
Plate 3.

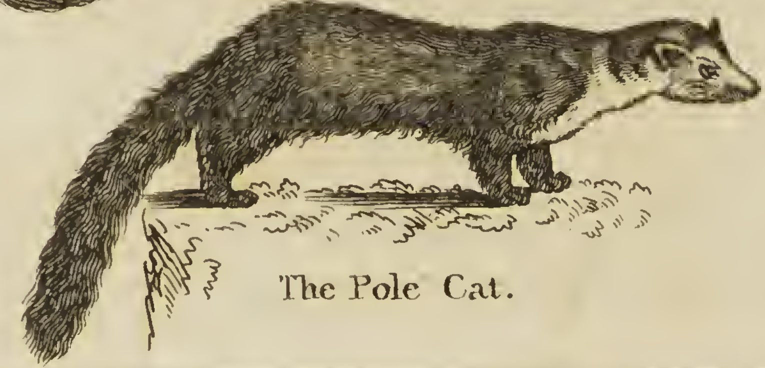


Wild Boar.



Hog of Siam.

Otter.



The Pole Cat.

other determinate cauſe than her whimſical vivacity. All the ſuppleneſs of the organs, all the nerves of the body, are ſcarcely ſufficient for the petulance and rapidity of theſe motions, which are all natural to her.

That theſe animals are naturally fond of mankind, and that in uninhabited places they do not become wild, the following anecdote is a ſtriking confirmation. In 1698, an Engliſh veſſel having put into harbour at the iſle of Boneviſte, two negroes preſented themſelves on board, and offered the Engliſh as many goats as they choſe to take. At the ſurpriſe which the captain ſhewed at this offer, the negroes obſerved there were but twelve perſons in the iſland; that the goats multiplied ſo faſt, that they became troubleſome; and that, far from having any trouble in taking them, they followed them with a kind of obſtinacy, like domeſtic animals.

Goats go five months with young, and bring forth at the beginning of the ſixth month. They ſuckle the young ones for about a month or five weeks; ſo that it may be reckoned about ſix-and-twenty weeks from the time of their coupling till the time that the young kid begins to eat. The goat generally produces one kid, ſometimes two, very rarely three, and never more than four; and ſhe brings forth young, from a year or eighteen months, to ſeven years. The knobs in the horns, and their teeth, aſcertain their age. The number of teeth is not always the ſame in female goats; but they have generally fewer than the male goat, which has alſo the hair rougher, and the beard and the horns longer. Theſe animals, like oxen and ſheep, have four ſtomachs, and chew the cud. This ſpecies is more diffuſed than the ſheep, and goats like ours are found in ſeveral parts of the world, only in Guinea, and other warm countries, they are ſmaller; but in Muſcovy, and other cold climates, they are larger. The goats of Angora, and of Syria, have ears hanging down, and are of the ſame ſpecies with ours. They mix and produce together, even in our climate. The males have horns almoſt as long as the common goat; but the circumference and directions are very different. They are extended horizontally on each ſide of the head, and form ſpirals, ſomewhat like a worm. The horns of the female are ſhort, and firſt turn round backwards, then bend down, and turn round before, ſo much, that they end near the eyes; and in ſome their circumference and direction vary. The male and female goat of Angora, which I have ſeen, are ſuch as I have deſcribed; and theſe goats, like all the animals of Syria, have the hair ſo very long and thick, and fine, that ſtuffs have been made of it, almoſt as handſome and gloſſy as our ſilks. It is, in fact, what is commonly termed *mohair*.

The Hog.

I ſhall treat of the ſow, the hog of Siam, and the wild boar, at the ſame time, becauſe they form all three but one and the ſame ſpecies; one is wild, and the other two are domeſtic.

Ariſtotle firſt divided quadrupeds into beaſts with the hoof entire, thoſe with cloven feet, and the ſpecies which have claws. He allows that the hog is of an ambiguous nature; but the only reaſon he gives, is, that in Illyria ſwine are found which have hoofs, and in ſome other parts a ſpecies which have claws. This animal is alſo a kind of exception to the two general rules of nature, viz. That the larger animals are, the fewer young they produce at a birth; and that of all animals, thoſe which have claws are the moſt prolific. The hog, though in its make greatly above the middle ſize, produces more than any ſuch animal, or indeed, than any other quadruped.

To the ſingularities we have already related, we ſhall add another, which is, that the fat of the hog is different from that of almoſt all other quadruped animals, not only in its conſiſtence and quality, but alſo in its poſition in the body of the animal. The fat of man, and of animals which have no tallow, ſuch as the dog, the horſe, &c. is mixed pretty equally with the fleſh. The tallow in the ram, goat, the ſtag, &c. is found only in the extremities of it. The fat covers the fleſh and forms a thick, diſtinct, and continued bed or layer, between the fleſh and the ſkin. The hog has this in common with the whale, and other cetaceous animals, the fat of which is only a kind of lard, nearly of the ſame conſiſtence with, but more oily than, that of the hog. This lard in cetaceous animals alſo forms beneath the ſkin a bed of many inches in thickneſs, which envelopes the fleſh.

There are only the hog, and two or three other ſpecies of animals, which have defenſive or very long canine teeth. They differ from the other teeth, by coming out at the front, and growing during their whole lives. In the elephant and ſea-cow, they are cylindrical, and ſome feet long. In the wild boar and male hog, they are partly bent in form of a circle; and I have ſeen them from nine to ten inches in length. They are not very deep in the ſocket, and have alſo, like thoſe of the elephant, a cavity at the ſuperior extremity; but the elephant and ſea-cow have only theſe defenſive teeth in the ſuperior jaw, and even want canine teeth in the inferior jaw. The male hog and the wild boar on the other hand, have them in both jaws, and thoſe of the inferior are the moſt uſeful to this animal. Theſe are alſo the moſt dangerous; for it is with theſe lower tuſks the wild boar wounds.

Of all quadrupeds the hog appears the moſt rough and unpoliſhed. His voraciouſneſs ſeems to be owing to the inceſſant avidity he has to fill the vaſt capaciouſneſs of his ſtomach. It is the roughneſs of the hair, the hardneſs of the ſkin, and the thickneſs of the fat, which render theſe animals ſo inſenſible to blows. Mice have been known to lodge in their backs, and eat their fat and their ſkin, without their ſeeming ſenſible of it. Their other ſenſes are good; and the huntſmen know that wild boars both ſee, hear, and ſmell, at a great diſtance. In order therefore to ſurpriſe them, they wait in ſilence during the night, and place themſelves under the wind, to prevent the boars perceiving their ſmell, of which they are ſenſible at a great diſtance, and which makes them change their road immediately.

This imperfection in the ſenſes of the taſte and touch, is ſtill more increaſed by a diſtemper which is called the meazles, and which renders them almoſt abſolutely inſenſible. This diſorder proceeds in general from the coarſeneſs of their food; for the wild boar, which uſually lives on corn, fruits, acorns, and roots, is not ſubject to this diſtemper, any more than the young pig whilſt it ſucks. This is only to be prevented by keeping the domeſtic hog in a clean ſtable, and giving him plenty of wholeſome food. By theſe means his fleſh will become excellent to the taſte, and the lard firm and brittle, if he be kept for a fortnight or three weeks before he is killed, in a clean ſtable without litter, and get no food but dry corn. For this purpoſe we ſhould chuſe a ſow of about a year old, full of fleſh and fat.

The Wild Boar is hunted by dogs, or elſe taken by ſurpriſe in the night by the light of the moon. As he runs but ſlowly, leaves a ſtrong odour behind him, defends himſelf againſt the dogs, and wounds them dangerouſly, he ſhould not be hunted by dogs deſigned for the ſtag and the goat. The oldeſt only ſhould be attacked, and theſe are eaſily known by their traces. A young wild boar, of three years old, is difficult to take, becauſe he runs a great way without ſtopping. A wild boar that is older, on the other hand does not run far, ſuffers himſelf to be cloſely hunted, and is not much afraid of the dogs. In the day he uſually hides himſelf in the thickeſt and moſt unfrequented part of the wood, and in the evening and at night he goes out in queſt of food. In ſummer, when the corn is ripe, it is eaſy to ſurpriſe him, particularly among oats, where he frequents every night. As ſoon as he is killed, the huntſmen immediately cut out the teſticles, the ſmell of which is ſo ſtrong, that if five or ſix hours were to elapſe without cutting them out, all the fleſh would be infected. In an old wild boar the head only is good to eat; but, the fleſh of the young wild boar is extremely delicate.

Nobody is ignorant of the profits ariſing from the hog. His fleſh ſells for more than that of the ox, the lard for double, the blood, the bowels, the viſcera, the feet, and the tongue, when properly prepared, may all be eaten. The dung of the hog is much colder than that of other animals, and ſhould not be uſed for any but hot and dry lands. The ſkin hath its uſe, for ſieves are made of it; and brooms, bruſhes, and pencil-bruſhes are made of the hair. The fleſh of this animal takes ſalt and ſalt-petre better than any other, and will keep longer ſalted.

This ſpecies, though abundant, and greatly ſpread in Europe, in Africa, and in Aſia, was not, however, found on the Continent of the the world. They were tranſported by the Spaniards, who have carried black hogs to the Continent, and to almoſt all the large iſlands of America. They are multiplied and become wild in many places; and reſemble our wild boars, with this difference however, that the body is ſhorter, the head larger, and the ſkin thicker, and domeſtic hogs in warm climates are all black like wild boars.

The Hog of Siam reſembles the wild boar more than the common hog. One of the moſt evident ſigns of degeneration is the ears, which become much more ſupple when the animal changes into the domeſtic ſtate: in ſhort, thoſe of the domeſtic hog are not near ſo ſtiff, are much longer, and more pendant, than thoſe of the wild boar, which ſhould be regarded as the model of the ſpecies.

CHAP. VIII.

OF ANOTHER CLASS OF DOMESTIC ANIMALS—THE DOG—ITS VARIETIES—OF THE CAT, &c.

THE largeneſs of the make, the elegance of the form, the ſtrength of the body, the freedom of the motions, and all the exterior qualities are not the nobleſt properties in an animated being. As in mankind, underſtanding is preferred to figure, courage to ſtrength, and ſentiment to beauty; ſo the interior qualities are thoſe which we eſteem moſt in animals. It is in theſe that they differ from the automaton, it is by theſe they are raiſed above the vegetable, and made to approach nearer to ourſelves. It is their ſenſe which ennobles their being, which regulates, which enlivens it, which commands the organs, makes the members active, gives birth to deſire, and gives to matter progreſſive motion, will, and life.

The dog, independently of his beauty, vivacity, ſtrength, and ſwiftneſs, has all the interior qualities which can attract the regard of man. The tame dog comes crawling to lay at his maſter's feet his courage, ſtrength, and talents, and waits his orders to uſe them. He conſults, he interrogates, and he beſeeches. The glance of his eye is ſufficient; he underſtands the ſigns of his will. Without the vices of man, he has all the ardour of ſentiment, and, what is more, he has fidelity and conſtancy in his affections. He has no ambition, no intereſt, no deſire of revenge, no fear but that of diſpleaſing his maſter. He is all zeal, all warmth, and all obedience. More ſenſible to the remembrance of benefits than of wrongs, he ſoon forgets, or only remembers them to make his attachment the ſtronger. Far from running away, he licks the hand which is the cauſe of his pain, he only oppoſes it by his cries, and at length entirely diſarms it by his patience and ſubmiſſion.

More docile and flexible than any other animal, the dog is not only inſtructed in a ſhort time, but he even conforms himſelf to the motions, manners, and habits of thoſe who command him. He has all the manners of the houſe where he inhabits. Like the other domeſtics, he is always attentive to his maſter; and, ſtriving to anticipate the wants of his friends, he gives no attention to indifferent people. When the care of the houſe is intruſted to him during the night, he becomes ſometimes ferocious. He watches, he walks his rounds, he ſcents ſtrangers afar off; and if they happen to ſtop, or attempt to break in, he flies to oppoſe them, and by reiterated barkings, efforts, and cries of paſſion, he gives the alarm. As furious againſt men of prey as againſt devouring animals, he flies upon, wounds and tears them, and takes from them what they were endeavouring to ſteal; but, content with having conquered, he reſts himſelf on the ſpoils, will not touch it even to ſatisfy his appetite, and at once gives an example of courage, temperance, and fidelity.

Thus we may ſee of what importance this ſpecies is in the order of nature. Without the aſſiſtance of the dog, how could man have been able to tame, and reduce into ſlavery, other animals? How could he have diſcovered, hunted and deſtroyed, wild and obnoxious creatures? To keep himſelf in ſafety, and to render himſelf maſter of the living univerſe, it was neceſſary to begin by making himſelf friends among animals, in order to oppoſe them to others. The firſt art, then, of mankind, was the education of dogs, and the fruit of this art was the conqueſt and peaceable poſſeſſion of the earth.

The dog, faithful to man, will always preſerve a portion of empire, and a degree of ſuperiority over other animals. He commands them, and reigns himſelf at the head of a flock where he makes himſelf better underſtood than the voice of the ſhepherd. Safety, order, and diſcipline are the fruits of his vigilance and activity. But it is above all in war againſt thoſe animals which are his enemies, or which are independent, that his courage ſhines forth, that his underſtanding is diſplayed, and that his natural and acquired talents are united. As ſoon as the ſound of the horn, or the voice of the huntſman, has given the ſignal of an approaching war, tranſported with freſh ardour, the dog expreſſes his joy, and ſhews by his motions, and cries of impatience, his deſire to combat and to conquer. Then, in ſilence, he inveſtigates the traces of his enemy, and, by different cries, indicates the time, the diſtance, the ſpecies, and even the age, of his prey.

In deſerts, and depopulated countries, there are wild dogs which in their manner differ only from wolves by the facility with which they are tamed. They unite alſo in large troops, to hunt and attack by force wild boars and bulls, and even lions and tygers. In America, the wild dogs ſpring from a breed anciently domeſtic, having been tranſported from Europe; and having been either forgotten or abandoned in theſe deſerts, are multiplied to ſuch a degree that they go in troops to inhabited places, where they attack the cattle, and ſometimes even inſult the inhabitants. They are then obliged to drive them away by force, and to kill them like other ferocious animals; and in fact, dogs are ſuch till they become acquainted with man. When, however, we approach them with gentleneſs, they ſoon become familiar, and remain faithfully attached to their maſters. The wolf, on the other hand, although taken young, and bred in the houſe, is only gentle in his youth, for he never loſes his deſire for prey, and ſooner or later he gives himſelf up to his fondneſs for rapine and deſtruction.

The dog is the only animal whoſe fidelity may be put to the proof. He is the only one which always knows his maſter and his friends. The only one who perceives the approach of a ſtranger. The only animal, in ſhort, whoſe talents are evident, and whoſe education is always good.

Of all animals, the dog has an underſtanding moſt ſuſceptible of impreſſions, and is moſt eaſily taught by moral cauſes. He is alſo, above all other creatures, moſt ſubject to the variety and other alterations occaſioned by phyſical influences. The temperament, the faculties, and habits of dogs vary prodigiouſly, and their form is not uniform. In the ſame country, one dog is very different from another dog, and the ſpecies is quite different in itſelf in different climates.

But, what is moſt difficult to aſcertain in the numerous variety of different races, is the character of the primitive and original breed. How are we to know the effects produced by the influence of the climate, food, &c.?

Amongſt domeſtic animals, the dog is, above all others, that which is moſt attached to man. He is that in which ſentiment predominates enough to render him docile, obedient, and ſuſceptible of all impreſſions, and even of all conſtraint. It is not aſtoniſhing, therefore, that of all animals this ſhould alſo be that in which we find the greateſt variety, not only in figure, in height, and in colour, but in every other quality.

There are alſo ſome circumſtances, which concur to this change. The dog in general lives but a ſhort time; it produces frequently, and in pretty large numbers; and as it is perpetually beneath the eyes of man, as ſoon as by a chance uſual to nature, there may have been found among ſome individuals, ſingularities, or apparent varieties, endeavours may have been uſed in order to perpetuate them, by uniting together theſe ſingular individuals, as we do at preſent, when we wiſh to procure new breeds of dogs, and other animals.

Dogs which have been abandoned in the deſerts of America, and have lived wild for a hundred and fifty, or two hundred years, though changed from their original breed when they are ſprung of the domeſtic dogs, have notwithſtanding this long ſpace of time retained, at leaſt in part, their primitive form, and travellers report that they reſemble our greyhound. Theſe wild dogs, however, are extremely thin and light; and as the grey hound does not differ much from the cur, or from the dog which we call the ſhepherd's dog, it is natural to think, that theſe wild dogs are rather of this ſpecies, than real greyhounds. Ancient travellers inform us, that the dogs of Canada had the ears ſtraight like foxes, and reſembled the middle-ſized maſtiff, that is, our ſhepherd's dog, and that thoſe of the deſerts of the Aratilles iſles, had alſo the head and ears very long, and are very like foxes.

Beſides what we learn from the narratives of travellers, we find that dogs of cold climates have all long ſnouts and ſtraight ears; that thoſe of Lapland are ſmall, that their ears are ſtraight, and their ſnouts pointed; that thoſe of Siberia, known by the name of wolf-dogs, are larger than thoſe of Lapland; but that they have alſo the ears ſtraight, the hair rough, and the ſnout pointed. We learn too that thoſe of Iceland, have alſo ſome reſemblance to thoſe of Siberia; and that, even in warm climates, ſuch as the Cape of Good Hope, the dogs natural to the countries have ſharp ſnouts, ſtraight ears, the tail dragging on the ground, and the hair ſhining, but long and frizzled.

We may preſume, then, that the ſhepherd's dog approaches neareſt to the primitive races of this ſpecies; for in all countries inhabited by ſavages, or, at leaſt, by men half-civilized, the dogs reſemble this breed more than any other. On the whole continent of the new world, they had no other. In France, where this ſpecies is uſually called the ſhepherd's dog, and in other temperate climates, it is ſtill more numerous; though we are much more occupied in giving birth to, or in multiplying, the breeds which are more pleaſing, than preſerving thoſe which are more uſeful, and which we have diſdained and abandoned to the peaſants, who have the care of our flocks.

Dogs are generally produced with their eyes ſhut. The two eye lids are not only cloſed, but adhere by a membrane, which breaks away as ſoon as the muſcle of the upper eye lid is become ſtrong enough to raiſe itſelf, and to overcome this obſtacle; and the greater number of dogs have not their eyes open till the tenth or twelfth day. At this time, the bones of the ſkull are not finiſhed, the body is puffed out, the ſnout is ſwelled, and they have not their proper form; but in leſs than a month they learn to make uſe of all their ſenſes, and begin to have ſtrength and a ſwift growth. In the fourth month, they get ſome of their teeth, which all amount to forty two.

Bitches go with young nine weeks, that is, ſixty-three days, but never leſs than ſixty. Length of life in dogs is like that of other animals, proportioned to the time required for their growth; for if they are about two years in growing, they live about fourteen years.

In the Memoirs of the Academy of Sciences, we find the hiſtory of a bitch, which having been accidentally left behind in a country-houſe, ſubſiſted forty days without any other food than the ſtuff or the wool of a mattreſs that ſhe had torn. Water ſeems to be ſtill more neceſſary for dogs than food: they drink often, and a great deal at a time; and it is even a vulgar opinion, that if they want water long, they become mad.

To give a clearer idea of the order of dogs, of their generation in different climates, and of the mixture of their breeds, I ſubjoin a table, or rather a kind of genealogical tree, in which, with a glance of the eye, all the different varieties of the ſpecies may be ſeen.

The ſhepherd's dog is the ſtock or body of the tree. This dog, tranſported into the rigorous climate of the North, as into Lapland, for example, has become ugly and ſmall. He ſeems, however, to have been kept up, and even brought to perfection, in Iceland, Ruſſia, and Siberia, where the climate is leſs rigorous, and where the people are more civilized. Theſe changes have been occaſioned by the influence of climate alone, which has produced no great alteration in the form; for all theſe dogs have ſtraight ears, long and thick hair, and a wild look.

The ſame ſhepherd's dogs, tranſported into temperate climates, and among people who are quite civilized, ſuch as thoſe of England, France, or Germany, loſe their ſavage air, their ſtraight ears, their long, thick, and rough hair, and become maſtiff, hound, or bull-dog, by the influence of climate merely. Of the maſtiff, and the bull-dog, the ears are partly ſtraight, or only half hanging; and in their manners and ſanguinary diſpoſition they reſemble the dog, from which they drew their origin. The hound is the moſt diſtant of the three. The long hanging ears, the docility, gentleneſs, and, we may ſay, timidity of this dog, are ſo many proofs of the great degeneration, or rather the great perfection, which a long ſtate of ſubjugation has produced, joined to a careful, and well-followed education.

The hound, the ſetting-dog, and the terrier, are only one and the ſame race of dogs; for it has been remarked, that the ſame birth has produced ſetting-dogs, terriers, and hounds, though the hound bitch has only been covered by one of the three dogs.

The beagle, and almoſt all ſorts of dogs tranſported into Spain and Barbary, have hair fine, long, and thick, and become ſpaniels and barbets. The great and little ſpaniel, which differ only in ſize, when tranſported into England, change their colour from black to white, and by the influence of the climate are become large, ſmall, and ſhabby. To theſe we may add the terrier, which is but a black beagle, like the other, but with liver-coloured marks on the four feet, the eyes, and the ſnout.

The ſhepherd's dog, tranſported to the north, is become a large Dane, and into the ſouth, is become a greyhound. The large greyhounds come from the Levant; thoſe of a middle ſize from Italy. Greyhounds from the latter of theſe places, when tranſported into England become ſmaller greyhounds.

The large Danes, tranſported into Ireland, Ukrain, Tartary, Epirus, and Albany, are become large Iriſh dogs, and in ſize ſurpaſs all the reſt of the ſpecies.

The bull-dog, tranſported from England into Denmark, is become a ſmall Dane; and this ſmall Dane, when tranſported into warm climates, loſes its hair entirely, and becomes the naked Turk dog. All theſe races, with their varieties, have been produced ſolely by the influence of climate, joined to the effect of their food, and of a careful education. The other dogs are not of a pure race, and come from a mixture of theſe races.

The greyhound, and the ſhepherd's dog, have produced the mongrel greyhound, which is called the greyhound with wolf's cloathing. Of this mongrel the ſnout is not ſo thin as that of the Turkiſh greyhound, which is very rare in France.

The large Dane, and the large Spaniel, have produced together the dog of Calabria, which is a handſome dog with long, thick hair, and which is taller than the larger maſtiff.

The ſpaniel and the terrier produce another kind of dog, which is called the Burgundy ſpaniel. The ſpaniel and the little Dane produce the lion-dog, which is very ſcarce.

The dogs with long, fine, and curled hair, which are called dogs of Purgos, and which are of the ſize of the largeſt barbets, come from the large ſpaniel and the barbet.

The little barbet comes from the ſmall ſpaniel and the barbet.

The bull-dog produces, with the maſtiff, a mongrel, which is called the ſtrong bull-dog, and which is much larger than the real bull-dog, and approaches the bull-dog more than the maſtiff.

The pug comes from the Engliſh bull-dog, and the little Dane.

All theſe races are ſimple mongrels, and come from the mixture of two pure races; but there are alſo other dogs which may be called double mongrels, becauſe they come from the mixture of a pure race, and of one already mixed.

The ſhock-dog is a double mongrel, which comes from the pug and the ſmall Dane.

The dog of Alicant is alſo a double mongrel, which comes from the whelp and the little ſpaniel.

The Malteſe, or lap-dog, is a double mongrel, and comes from the ſmall ſpaniel and the barbet.

The Cat.

The cat, though an animal of prey, is a uſeful domeſtic. It is neither wanting in ſagacity nor ſentiment; but its attachments are ſtronger to places than to perſons. The form of its body correſponds with its diſpoſition. The cat is handſome, light, adroit, cleanly, and voluptuous. It loves eaſe, and ſearches out the ſofteſt furniture to lie upon.

Cats go with young fifty-five or fifty-ſix days. They are not ſo prolific as dogs, and their uſual number is four, five, or ſix. Young cats are gay, lively, pretty, and would be very proper to amuſe children, if the ſtrokes of their paws were not to be feared. Their diſpoſition, which is averſe to all reſtraint, renders them incapable of a regular education. We are told, nevertheleſs, of the Greek friars of Cyprus, having taught cats to hunt, take, catch, and deſtroy the ſerpents with which that iſland was infeſted. Their ſcent, which in the dog is an eminent quality, is far from being good, and therefore they do not purſue animals which they no longer ſee; but wait and attack them by ſurpriſe.

The moſt immediate phyſical cauſe of this inclination, which they have to ſpy out, and ſurpriſe other animals, is owing to the particular conformation of their eyes. The pupil, in man, as well as in the greater part of the lower animals, is capable of a certain degree of contraction and dilatation. It enlarges a little when there is no light, and contracts when the light becomes too ſtrong.

In the eye of a cat, and of nocturnal birds, this contraction and dilatation are ſo conſiderable, that the pupil, which in obſcurity is large and round, becomes in broad day, long and narrow like a line. For this reaſon theſe animals ſee better during the night than during the day, the form of the pupil being always round when it is not conſtrained. During the day, there is a continual contraction in the eyes of the cat, and it is only by effort, that he ſees in a ſtrong light; whereas at twilight, the pupil reſuming its natural form, he ſees perfectly, and avails himſelf of this advantage in knowing, attacking and ſurpriſing other animals.

Cats ſeem to have a natural dread of water, cold, and bad ſmells. They are fond of perfumes, and gladly ſuffer themſelves to be taken and careſſed by perſons who uſe them. The ſcent of Valerian has ſo powerful an effect on them, that they appear tranſported by it; and, in order to preſerve this plant in gardens, it is common to ſurround it with a cloſe fence. Cats will ſmell it from afar, will run and rub themſelves with it, and will paſs and repaſs ſo often over it, as to deſtroy it in a ſhort time.

As they are very cleanly, and as their coat is always dry and ſhining, their hair eaſily electrifies; and ſparks are ſeen to come from it, when rubbed with the hand in any dark place. Their eyes ſhine in the dark, almoſt like diamonds, and reflect outwardly, during the night, the light which they may be ſaid to have imbibed during the day.

In this climate, we know but one ſpecies of the wild cat; and it appears from the teſtimony of travellers, that this ſpecies is found in almoſt all climates, without any great variety. There were ſome of them on the continent of the New World before it was diſcovered. A huntſman carried one which he had found in the woods to Chriſtopher Columbus. This cat was of the common ſize, the hair of a dark grey, with the tail very long, and very ſtrong. There were ſome of the ſame ſort of wild cats in Peru, though they had no tame ones; and there are ſome in Canada, in the country of the Illineſe, &c. They have been ſeen in ſeveral parts of Africa, as in Guinea, at the Gold Coaſt, at Madagaſcar, where the original inhabitants had even domeſtic cats. At the Cape of Good Hope, Kolbe ſays, there are alſo ſome wild cats of a blue colour; and theſe blue, or rather ſlate-coloured cats, are found again in Aſia.

In general it may be remarked, that, of all the climates of the inhabited earth, thoſe of Spain and Syria are the moſt favourable to the beautiful varieties of Nature. The ſheep, the goats, the dogs, the cats, the rabbits, &c. of thoſe countries have the fineſt wool, the moſt beautiful and the longeſt hair, the moſt agreeable and the moſt varied colours. The colour of the wild cat, and its hair, like thoſe of moſt other wild animals, are rather coarſe. When tamed, the latter becomes more ſoft, the former more variegated; and in the favourable climate of Choraſan and Syria, the latter becomes longer, finer, more copious, the former uniformly ſoftened; the black and red changing into a tranſparent brown, and the dark brown into an aſh grey. By comparing a wild cat of our foreſts with one of thoſe of Choraſan or Syria, we ſhall find that the only difference between them conſiſts in this ſhaded variety of colours. As theſe animals have therefore more or leſs white upon the belly and the ſides, it is eaſy to conceive, that, in order to have cats entirely white, and with long hair, ſuch as we properly term cats of Angora, we have only to ſelect from this race thoſe which are moſt white on the belly and the ſides, and to unite them together, as is done with rabbits, with dogs, with goats, with ſtags, with deer, &c. In the province of Pe-chi-ly, in China, there are cats with long hair, and hanging ears, of which the Chineſe ladies are exceedingly fond. Theſe domeſtic cats with hanging ears, of which we do not poſſeſs a more ample deſcription, are, no doubt, more remote than thoſe with ſtraight ears, from the race of the wild cat, which, nevertheleſs, is the original and primitive race of all cats.

CHAP. IX.

OF CERTAIN INTERMEDIATE ANIMALS BETWEEN WILD AND DOMESTIC—THE STAG, OR RED DEER.—OF THE FALLOW-DEER, THE ROEBUCK, &c.

THE Stag is one of thoſe mild, innocent animals, which ſeem as if they were created ſolely to adorn and animate the ſolitude of the foreſts, and to occupy, remote from man, the peaceful retreats of Nature. His light and elegant form; his flexible, yet nervous limbs; his head rather adorned, than armed, with a living ſubſtance, which, like the branch of a tree, is every year renewed; his grandeur, his ſwiftneſs, his ſtrength, ſufficiently diſtinguiſh him from the reſt of the inhabitants of the foreſt.

The old ſtags ſhed their horns firſt, which happens about the end of February, or the beginning of March. Stags in their ſeventh year do not undergo this change till the middle or the end of March; nor do thoſe in the ſixth year, till the month of April.

After they have ſhed their horns, they ſeparate from each other; the very young ones only aſſociating together. They remain no longer in covert; they ſeek the beautiful parts of the country, the groves, and the open coppices, where they remain all ſummer, till they recover the antlers which uſed to adorn their brows. During this ſeaſon, they carry their heads low, for fear of ſtriking them againſt the branches; for they are exceedingly tender till they arrive at perfection. The horns of the oldeſt ſtags are ſcarcely half repaired by the month of May; nor do they attain their full length and hardneſs till about the end of July. The horns of the young ſtag are very late ſhed, and very late recovered; but when they are completely lengthened, and are become quite hard, they rub them againſt the trees, in order to bruſh off the ſcruf with which they are covered.

The hinds, or females, carry their young eight months and a few days. They are not all prolific; and there is one ſort in particular which is always barren. The fawn retains this appellation no longer than till it is ſix months old; then the knobs begin to appear, and it takes the name of a knobber, which it bears till theſe knobs are lengthened to ſo many points, whence they are termed prickets, or brockets. It does not quit its dam early, though it grows faſt, but follows her all the ſummer. In winter, the hinds, the knobbers, the prickets, and the young ſtags, reſort to the herd, and form troops, which are numerous in proportion as the ſeaſon is more ſevere. In ſpring they divide, the hinds retiring to bring forth their young; and at this time there is ſcarcely any but the prickets and the young ſtags which aſſociate. In general, the ſtags are inclined to remain with each other, and to roam abroad in companies; and it is only from fear or neceſſity that they are ever found ſeparated.

The growth of the horns appears to depend on the redundancy of the fluids, and has a near connection with the production of the ſeminal fluid; for when caſtrated, the horns of the ſtag ceaſe to grow.

The beauty of this, as indeed of every part, depends much upon their food; for a ſtag which lives in a plentiful country, where he feeds at his eaſe, where he is neither diſturbed by men nor dogs, where, he may lie down and ruminate in quiet, has always a beautiful head, high, open, palmated, large, and well-adorned at top, broad and curled at bottom, with a great number of long and ſtrong antlers. In a country on the other hand where he has neither ſufficient food nor repoſe, his head will be in theſe reſpects the reverſe. Hence it is not difficult to diſtinguiſh by the horns of a ſtag, whether or not he inhabits a fertile or barren country.

The branches which ſprout from the head of the ſtag, in their make and growth, reſemble thoſe of a tree. Their ſubſtance alſo is, perhaps, more of the nature of wood than of bone. It is, as it were, a vegetable grafted upon an animal, which partakes of the nature of both, and forms one of thoſe ſhades by which Nature always approximates two extremes.

The ſtag paſſes his whole life in the alternatives of plenitude and want, of corpulence and leanneſs, of health and ſickneſs, without having his conſtitution much affected by the violence of the change. Nor is he ſhorter lived than other animals, which are not ſubject to ſuch viciſſitudes. As he is five or ſix years in growing, ſo he generally lives, thirty-five or forty years. What has been reported, therefore, concerning the prodigious longevity of the ſtag, is without any good foundation, though ſupported by the ſtory of one which was taken by Charles VI. in the foreſt of Senlis, with a collar round its neck, whereon was inſcribed, "Cæſar hoc me donavit." People choſe rather to believe that this animal had lived a thouſand years, and had received this collar from a Roman Emperor, than to conclude that he might come from Germany, where the Emperors have always aſſumed the title of Cæſar.

The horns of the ſtag continue to increaſe in bulk and height from the ſecond year to the eighth. They remain beautiful, and much the ſame, during their vigour of life; but as their body declines with age, ſo do their horns.

It is but ſeldom that our ſtags have more than twenty or twenty-two antlers, even when their head is in its moſt beautiful ſtate. And, as the ſize of the ſtag's head depends on the quantity of his food, ſo the quality of his horns depends on the quality of it. In fertile countries the quality of the horn is, like the wood of the foreſt, large, ſoft, and light; and, on the contrary, ſhort, hard and heavy, in ſuch as are barren.

The moſt common colour of the ſtag is yellow, though there are many found of a brown, and many of a red colour. White ſtags are much more uncommon, and ſeem to become domeſtic. The colour of the horns, like that of the hair, depends on the nature and age of the animal, and in general on the impreſſion of the air. The horns of the young ſtags are whiter than thoſe of the old ones. Of thoſe ſtags alſo whoſe hair is of a light yellow, the horns are often of a ſallow hue, and offenſive to the eye.

This animal ſeems to have good eyes, an exquiſite ſmell, and an excellent ear. When he would hearken to any thing, he raiſes his head, pricks up his ears, and then he hears from a great diſtance. When he iſſues from a little coppice, or ſome other ſpot half covered, he ſtops in order to take a full view around him, and then ſnuffs up the wind in order to try whether he can diſcover the ſcent of any thing that may diſturb him. Though naturally ſimple, he is far from being deſtitute of curioſity and cunning. If one whiſtles, or calls aloud to him from a great diſtance, he inſtantly ſtops ſhort, and gazes with fixed attention; but if one has neither arms nor dogs, he paſſes along without altering his pace. With equal tranquillity and pleaſure he ſeems alſo to liſten to the ſhepherd's pipe, or flageolet; and the huntſmen, in order to embolden them, ſometimes uſe theſe inſtruments. In general, he is much leſs afraid of men than of dogs, and entertains neither diſtruſt nor artifice, but in proportion as he is diſturbed. He eats ſlowly, chuſes his food, and ſeeks afterwards to repoſe himſelf, that he may ruminate at leiſure, though not with the ſame eaſe as the ox; nor is it without undergoing much violence, that the ſtag, can throw up the food contained in his firſt ſtomach. He ſeldom drinks in the winter, and ſeldomer ſtill in the ſpring.

The Fallow-deer.

No two animals can be more nearly allied than the ſtag and the fallow-deer; and yet no two animals more eagerly ſhun each other. They are never ſeen to herd in the ſame place. It is even rare, unleſs they have been tranſported thither, to find fallow deer in a country where ſtags are numerous. They ſeem to be leſs robuſt and leſs ſavage than the ſtag. They are found but rarely wild in the foreſts, and are bred up in parks, where they may be conſidered half-domeſtic.

Of all the countries of Europe, England abounds moſt in ſtags; and in this country their fleſh is highly valued. It ſeems to be an animal formed for a temperate climate; for it is never found in Ruſſia, and very rarely in the foreſts of Sweden, or in any other northern country. And as the fallow-deer is an animal leſs ſavage, more delicate, and it may be added, more domeſtic than the ſtag, it is likewiſe ſubject to a greater number of varieties. Beſide the common deer, and the white deer, there are ſeveral other kinds. The deer of Spain, for example, which are almoſt as large as the ſtags, but whoſe neck is more ſlender, whoſe colour is more obſcure, and whoſe tail is rather black than white underneath, and longer than that of the common deer. The deer of Virginia, which are almoſt as large as thoſe of Spain. Other deer, whoſe forehead is compreſſed and flattened between the eyes, whoſe ears and tail are longer than thoſe of the common deer, and whoſe hind legs have the hoofs marked with a white ſpot; and others, which are ſpotted or ſtreaked with white, black, and yellow; and others ſtill, which are entirely black.

The head of the buck, like that of the ſtag, is ſhed every year, and takes nearly the ſame time for repairing.

It frequently happens, that an herd of fallow-deer is ſeen to divide into parties, and to engage each other with great ardour. They both ſeem deſirous to gain ſome favourite ſpot of the park for paſture, and to drive the vanquiſhed party into the coarſer and more diſagreeable parts. Each of theſe factions has its particular chief, namely, the oldeſt and the ſtrongeſt of each herd. Theſe lead on to the engagement; and the reſt follow under their direction. Their combats are ſingular enough, from the diſpoſition and conduct by which their mutual efforts ſeem to be regulated. They attack with order, and ſupport the aſſault with courage. They come to the aſſiſtance of each other; they retire, they rally, and never yield the victory upon a ſingle defeat. The combat is renewed every day, till at length the more feeble ſide is obliged to yield, and eſcape to the moſt diſagreeable part of the park.

From the age of two, till that of fifteen or ſixteen, the fallow-deer is in a condition to produce. In ſhort as it reſembles the ſtag in all its natural habits, the greateſt difference we find between theſe two animals, is in the duration of their lives. From the teſtimony of huntſmen, it has been mentioned, that the ſtag lives to the age of thirty-five or forty; and, on the ſame authority, it is aſſerted, that the fallow-deer lives but about twenty years. We may add, that as the fallow-deer is ſmaller than the ſtag, it is probable, that in growth it is ſomewhat quicker.

The Roe-Buck.

The ſtag, as being the moſt noble among the tenants of the woods, inhabits the moſt ſecret parts of the foreſt, where the ſpreading branches form a lofty covert. Whilſt the roe-buck contents himſelf with a more lowly reſidence, and is ſeldom found but among the thick foliage of young trees and ſhrubs. But, if this animal is leſs noble, leſs ſtrong, and leſs elevated in ſtature, he is, however, poſſeſſed of more grace, more vivacity, and even of more courage, than the ſtag. Though but a ſmall animal, yet, when his young are attacked, he combats even the ſtag himſelf, and often obtains the victory. He is more gay, more handſome, more active; his ſhape is more full and more elegant, and his figure is more agreeable than that of the ſtag. His eyes, in particular, are more brilliant, and more animated; his limbs are more ſupple, his movements quicker; and, poſſeſſed of equal vigour and agility, he bounds without effort.

The roe-buck differs from the ſtag, not only in ſuperior cunning, but alſo in his natural appetites, his inclinations, and his whole habits of living. Inſtead of herding together like the latter, the ſpecies of the former live in ſeparate families. The ſire, the dam, and the young ones, form of themſelves a little community, nor do they ever admit a ſtranger into it. All other animals of the deer kind, are inconſtant in their affection. The roe buck never forſakes his mate; and as they have been generally bred up together, the male and female form for each other the ſtrongeſt attachment.

The female of this ſpecies goes with young five months and a half, and brings forth about the end of April, or the beginning of May. The hind goes more than eight months; which circumſtance of itſelf is ſufficient to prove, that theſe animals are of a ſpecies ſo different, that they can never produce an intermediate race. The female ſeparates herſelf from the male, when ſhe is about to bring forth, retiring into the thickeſt part of the woods, in order to avoid the wolf, which is her moſt dangerous enemy. At the expiration of about ten or twelve days, the fawns, of which there are generally two at a birth, attain ſtrength enough to follow her. When ſhe is threatened with any danger, ſhe hides them in ſome deep thicket, oppoſes herſelf to the danger, and allows herſelf to be chaced.

The fawns continue to follow the buck and the doe eight or nine months in all; and upon ſeparating, their horns begin to appear, like thoſe of the ſtag, the firſt year, ſimple, and without antlers. Theſe they ſhed at the latter end of autumn, and renew during the winter.

In the ſtag, the fallow-deer, and the roe-buck, there are two bony eminences, on which their horns grow, which begin to ſhoot at the end of five or ſix months, and which, ſoon after arrive at their full growth. Far, however, from enlarging themſelves as the animal advances in age, they diminiſh, and are beſt evidence of the age of the ſpecies.

As the female goes only five months and a half with young, and as the growth of the young roe-buck is quicker than that of the young ſtag, ſo his life is ſhorter; and I do not believe that it extends beyond twelve or fifteen years, at the fartheſt. The roe-bucks remain in winter in the thickeſt coppices, and live on briars, broom, heath, &c. In ſpring, they repair to the more open groves, and browſe upon the buds and young freſh leaves of almoſt every tree. This warm food, fermenting in their ſtomachs, inebriates them much, and renders them eaſy to be ſurpriſed.

It appears, that this ſpecies, which is not ſo numerous as that of the ſtag, and which is very ſeldom to be found in many parts of Europe, is pretty numerous in America. In that country, however, we hear only of two ſorts, the red, which is the larger, and the brown, which is the ſmaller; and, as they are oftener found in the northern than in the ſouthern parts of that continent, we may preſume, that they differ more from each other there than they do in Europe. In Louiſiana, for inſtance, they are extremely common, and are much larger than in France. They are alſo found at Braſil; for the animal which is there denominated the *Cujuacu-apara*, differs not from the European roe-buck, more than the Canadian ſtag differs from that of France.

CHAP.

C H A P. X.

OF WILD ANIMALS—THE HARE, AND THE RABBIT.

The Hare.

HARES abound in every quarter of the globe; and rabbits, though they originated only in particular climates, multiply ſo prodigiouſly in almoſt every place to which they are tranſported, that no ſmall art is required to diminiſh their number.

In thoſe diſtricts which are reſerved for the chace, four or five hundred hares are killed in the courſe of perhaps one day's ſport. Theſe animals multiply amazingly; they are in a condition to engender in all ſeaſons, and that too before their firſt year is expired. The females do not go above thirty or thirty-one days with their young. They produce three or four young ones, and they are again ready to receive the male. They likewiſe receive him while they are pregnant, and, by a particular formation of their genitals, are often found to have a ſuper-fœtation.

The young ones are brought forth with their eyes open. The dam ſuckles them for the ſpace of twenty days; after which they leave her, and provide for themſelves; they do not part far from each other; yet they live in ſolitude, and each compoſes for itſelf a form, at a little diſtance. Thus, when we find a young leveret in one place, we are almoſt ſure of finding one or two more in the neighbourhood. They feed more by night than by day; and their favourite articles of food are, herbs, roots, leaves, fruit and grain; but particularly ſuch plants as yield a milky juice. They even eat the bark of trees in winter. When they are reared at home, they are fed with lettice and roots; but the fleſh of theſe domeſtic hares has always a bad flavour.

Hares ſleep much, but always with their eyes open. They have no eye-laſhes, and ſeem to have but bad eyes. Their hearing, however, is exceedingly acute, and their ears are very large compared with the ſize of their body. They move theſe long ears with great eaſe, and uſe them as a helm, in order to direct their courſe, which is ſo rapid, that they outſtrip almoſt every other animal. As their fore legs are much ſhorter than their hind ones, they can more eaſily aſcend than deſcend; for which reaſon, when they are purſued, their firſt object is to gain, if poſſible, ſome mountain. Their motion in running is a kind of gallop. They proceed without making any noiſe, becauſe their feet are plentifully covered with hair; and they perhaps are the only animals which have hair growing within their mouths.

The hare does not live above ſeven or eight years. They paſs their lives in ſolitude, and in ſilence; and they are never known to exert their voice, but when they are forcibly laid hold of, tormented, or wounded. They are by no means ſo wild as by their habits might be ſuppoſed. They are gentle, and ſuſceptible of a ſpecies of improvement. As they have a good ear, as they reſt on their hind-feet of their own accord, and uſe their fore-legs like arms, ſome have been taught to beat a drum, and to geſticulate in cadence, &c.

In general, the hare is not deſtitute of the inſtinct neceſſary for its preſervation, nor of ſagacity ſufficient to effect an eſcape from its enemies.

mies. It prepares for itſelf a form; and in winter, it chuſes a ſpot which is expoſed to the ſouth, as in ſummer it does one which is ſituated to the north. It hides itſelf from view among hillocks of earth which are of the ſame colour as its hair. "I have ſeen," ſays Du Foilloux, "a hare ſo cunning, that, as ſoon as it heard the huntſman's horn, it ſtarted from its form, and, though at the diſtance of a quarter of a league from it, leaped to a pond where it hid itſelf among the ruſhes, and thus eſcaped the purſuit of the dogs. I have ſeen a hare, which, after having run above two hours before the dogs, has diſlodged another hare, and taken poſſeſſion of its form. I have ſeen others ſwim over three ponds, of which the ſmalleſt was not leſs than eighty paces broad. I have ſeen others, which, after having been warmly chaced for two hours, have entered a ſheep-cot, through the little opening under the door, and remained among the cattle. I have ſeen others, when purſued, join a flock of ſheep in the field, and remain with them. I have ſeen others, which, when they heard the dogs, have concealed themſelves in the earth. I have ſeen others, which have gone along one ſide of a hedge, and returned by the other; ſo that there was only the thickneſs of the hedge between the dogs and them. I have ſeen others, which, after they had been chaſed for half an hour, have mounted an old wall of ſix feet high, and taken refuge in a hole covered with ivy."

The nature of the ſoil has a great influence on theſe, as well as on every other animal. The hares of the mountains are larger and fatter than thoſe of the plains, and they are alſo of a different colour; the former being browner on the body, and whiter about the neck, than the latter, which are more inclined to red. On high mountains, and in the northern countries, they become white in the winter, and in ſummer regain their ordinary colour

The Rabbit.

Though the hare and the rabbit are externally, as well as internally, very much alike, yet they form two diſtinct and ſeparate ſpecies.

The fecundity of the rabbit is even greater than that of the hare. Without crediting, however, what Wotten has advanced, that one pair being left in an iſland, produced ſix thouſand in one year, it is certain, that theſe creatures multiply ſo prodigiouſly in countries which are proper for the breed, that the earth cannot furniſh them with ſubſiſtence. They deſtroy herbs, roots, grain, fruit, and even trees and ſhrubs; and, were it not for the dog and the ferret, they would reduce the country to a deſert. The rabbit not only engenders and produces oftener than the hare, but it has more ways to eſcape from its enemies, and to conceal itſelf from man.

This circumſtance alone may ſuffice to prove, that the rabbit is ſuperior to the hare in point of ſagacity. Both are alike in their conformation, and both have it in their power to dig retreats for themſelves. Both are timid to an exceſs; but the one, poſſeſſed of leſs art, is contented with forming for itſelf a reſidence on the ſurface of the earth, where it remains continually expoſed. While the other, by a more improved inſtinct, takes the trouble to dig into the earth, for an aſylum; and ſo true is it, but as in this caſe they act from ſentiment, we never ſee the domeſtic rabbit employed in the ſame work.

The domeſtic rabbits, like all other domeſtic animals, vary in their colour: white, black and grey belong properly to Nature. The black rabbits are the moſt ſcarce.

Theſe animals are able to engender and produce at the age of five or ſix months. It is aſſerted, that they commonly attach themſelves to one particular female, and never quit her. She goes with young thirty or thirty-one days, and will produce five, ſix, and ſometimes ſeven or eight at a birth. Like the doe-hare, ſhe has a double matrix, and of conſequence can have in her womb at the ſame time, two ſeparate litters. It appears, however, that ſuper-fœtations are leſs frequent in this ſpecies than in that of the hare.

A few days before they bring forth, they dig themſelves a freſh burrow, not in a right line, but in a crooked direction, at the bottom of which they make an excavation. After this they tear a quantity of hair from their bellies, and make a kind of bed for the uſe of their young. For the firſt two days they never quit them: they never ſtir abroad, unleſs forced by neceſſity, and they return immediately. At this ſeaſon they eat much and very quickly; and thus they tend and ſuckle their young above ſix weeks. Till after this period, the buck does not make his advances to the doe. Often, even when ſhe quits the burrow and leaves her young behind, ſhe ſtops up the entry to it with earth, diluted with her urine; but when they begin to venture to the edge of the hole, and to eat groundſel and other herbs which the doe picks out for them, the buck begins to take them between his paws, to endeavour to give a gloſs to their hair, to lick their eyes; and all of them, in their turn, partake equally of his care.

A gentleman, in my neighbourhood, who had amuſed himſelf with raiſing rabbits for many years, has favoured me with the following remarks.

“ I began,” ſaid he, “ with only one male and one female, the former white, the latter grey; and of their produce, which was very numerous, the greateſt part were grey, a good number of them white, and of mixed colour, and ſome few black. Theſe animals ſeem to have a great reſpect for paternal authority; at leaſt I judge ſo, from the great deference which all my rabbits ſhewed for their firſt anceſtor, whom I can always eaſily diſtinguiſh by his whiteneſs, and who is indeed the only male of that colour which I have preſerved. It was to no purpoſe the family increaſed. Thoſe which, in their turn, became fathers, were ſtill ſubordinate to him. Whenever they fought, whether on account of their females, or concerning their food, their great progenitor would run to the place of diſpute with all ſpeed, as ſoon as he heard the noiſe. No ſooner did they perceive him, than every thing was preſently reduced to order; and if he ſurpriſed any one of them actually aſſaulting another, he uſed to ſeparate him from the reſt, and puniſh him upon the ſpot. Another proof of his dominion over all his poſterity, is, that they were accuſtomed to return at a whiſtle. Whenever I gave the ſignal, how diſtant ſoever they might be, this old one immediately put himſelf at their head; and though he came firſt, yet he made them all file off, and enter before him.

CHAP.

CHAP. XI.

OF CARNIVOROUS ANIMALS—THE WOLF—THE FOX—THE BADGER—THE OTTER—THE MARTIN—THE PINE WEASEL—THE POLE CAT—THE FERRET—THE WEASEL—THE ERMINE.

ANIMALS which have but one ſtomach, and whoſe inteſtines are ſhort, are forced, like man, to feed on fleſh. Of this affinity, and of this truth, we ſhall procure certain information by a relative compariſon of the ſize of the inteſtinal canal in carnivorous animals, and in thoſe that live ſolely on herbage. We ſhall then find, that the difference in the manner of living depends ſolely on the difference in their conformation, and that their nouriſhment is more or leſs ſolid, as the receptacle for it is more or leſs capacious.

Hence, however, we muſt not conclude, that thoſe animals which live ſolely on herbage are, from phyſical neceſſity, as carnivorous animals are with reſpect to fleſh, abſolutely confined to one kind of food. It is not meant, that they might not uſe animal food, or that if Nature had furniſhed them with arms, not only for the purpoſes of ſelf-defence, but for thoſe of attack and rapine, they would not have exerted them; ſince we find, that ſheep, calves, goats, horſes, greedily eat milk and eggs, which are animal food, and that, unaided by cuſtom, they do not refuſe meat which has been haſhed and ſeaſoned with ſalt.

We need not, therefore, ſcruple to conclude, that the generally predominant appetite of animals is for fleſh and other ſolid food, and that this appetite is more or leſs vehement, more or leſs moderate, according to the particular conformation of each animal. For on taking a full view of Nature, we find it not only in man, but in quadruped animals, in fiſhes, and even in inſects, and in worms.

The Wolf.

The wolf is one of thoſe animals whoſe appetite for animal food is the moſt vehement, and whoſe means of ſatisfying this appetite are the moſt various. Nature has furniſhed him with ſtrength, with cunning, with agility, with all thoſe requiſities, in a word, which fit an animal for purſuing, overtaking, and conquering its prey. Notwithſtanding all theſe, he moſt frequently dies of hunger; for he is the declared enemy of man. Being long preſcribed, and a reward offered for his head, he is obliged to fly from the habitations of men, and to live in the foreſt. When preſſed with hunger, however, he braves danger, and comes to attack thoſe animals which are under the protection of man, particularly ſuch as lambs, ſheep, or even dogs themſelves. If this excurſion has ſucceeded, he often returns to the charge, till having been wounded, or cloſely purſued by the dogs or the ſhepherds, he hides himſelf by day in the thickeſt coverts, and, for a while, only ventures out at night. At laſt, however when his neceſſities are very urgent, he boldly faces certain deſtruction. He attacks women and children, and ſometimes ventures even to fall upon men. He becomes furious by his continual agitations, and ends his life in madneſs.

The wolf, as well externally as internally, ſo nearly reſembles the dog, that he ſeems modelled upon the ſame plan; and yet he only preſents us with the reverſe of the image. If his form be ſimilar, his nature is, however, different; and indeed they are ſo diſſimilar in their diſpoſitions, that no two animals can have a more perfect antipathy to each other. A young dog ſhudders at the ſight of a wolf; a dog who is ſtronger, and who knows his ſtrength, briſtles up at the ſight, teſtifies his animoſity, attacks him with courage, endeavours to put him to flight, and exerts his utmoſt efforts to rid himſelf of ſo hateful a creature. They never meet without flying from, or fighting with each other. If the wolf is the ſtronger, he tears and devours his prey. The dog, on the contrary, is more generous, and contents himſelf with his victory.

The dog, even in his ſavage ſtate, is not cruel; he is eaſily tamed, and continues firmly attached to his maſter. The wolf, when taken young, becomes tame, but never affectionate. Nature is ſtronger in him than education; he reſumes, with age, his natural diſpoſitions, and embraces the firſt opportunity to return to his native woods. Dogs, even of the dulleſt kinds, ſeek the company of other animals, and they are naturally diſpoſed to follow and accompany them. The wolf, on the contrary, is the enemy of all ſociety, nor does he keep much company even with thoſe of his kind. When they are ſeen in packs together, it is not to be conſidered as a peaceful ſociety, but a combination for war. They teſtify their hoſtile intentions by their loud howlings, and by their fierceneſs diſcover a project for attacking ſome great animal, ſuch as a ſtag or a bull, or for deſtroying ſome formidable dog. The inſtant their military expedition is compleated, their ſociety is at an end. They then part, and each returns in ſilence to his ſolitary retreat. There is not even any ſtrong attachment between the male and female; they ſeek each other only once a year, and remain but a few days together.

The difference in the duration of the pregnancy of the ſhe-wolf, who goes with young above an hundred days, and the bitch, who does not go above ſixty, proves, that the wolf and the dog, ſo different in diſpoſition, are ſtill more ſo in one of the principal functions of the animal œconomy.

The wolf generally brings forth five or ſix, and ſometimes even nine at a litter. The cubs are brought forth, like thoſe of the bitch, with the eyes cloſed. The dam ſuckles them for ſome weeks, and teaches them occaſionally to eat fleſh, which ſhe prepares for them, by chewing it firſt herſelf. They do not leave the den where they have been littered, till they are ſix weeks or two months old. It is not, however, till they are about ten or twelve months old, and till they have ſhed their firſt teeth and compleated the new, that the dam thinks them in a capacity to ſhift for themſelves. Whenever they have acquired arms from Nature, and have learned induſtry and courage from her example, ſhe declines all future care of them, and is again engaged in rearing a new progeny. Theſe animals require two or three years for their growth, and live to the age of fifteen or twenty.

The wolf grows grey as he grows old, and his teeth wear, like thoſe of moſt other animals. He ſleeps when his belly is full, or when he is fatigued, rather by day than night, and is always very eaſily waked. He drinks frequently; and in times of drought, when there is no water to be found in the trunks of old trees, or in the pools about the foreſt, he often viſits the brooks, or lakes in the plain. Although very voracious, he ſupports hunger for a long time, and often lives four or five days without food, provided he is ſupplied with water.

The wolf has great ſtrength, particularly in his foreparts, in the muſcles of his neck and jaws. He carries off a ſheep in his mouth without letting it touch the ground, and runs with it much ſwifter than the ſhepherds who purſue him. Hence nothing but the dogs can overtake, or oblige him to quit his prey. He bites cruelly, and always with greater vehemence in proportion as he is leſs reſiſted; for he uſes precautions with ſuch animals as attempt to ſtand upon the defenſive. He is cowardly, and never fights but when under a neceſſity of ſatisfying his hunger, or of making good his retreat. When he is wounded by a bullet, he is heard to howl; and yet, when ſurrounded by the peaſants, and attacked with clubs, he never howls, but defends himſelf in ſilence till the laſt.

If he happens to be caught in a pit-fall, he is for ſome time ſo aſtoniſhed, that he may be killed without offering to reſiſt, or taken alive without much danger. At that inſtant, one may clap a collar round his neck, muzzle him, and drag him along, without his ever betraying the leaſt ſymptom of anger or reſentment. At all other times, he has ſenſes in great perfection. He ſmells a carcaſe at the diſtance of more than a league. He alſo perceives living animals a great way off, and follows them a long time upon the ſcent. Whenever he leaves the wood, he always takes care to go out againſt the wind. No ſooner does he arrive at its extremity, than he ſtops to examine, by his ſmell, on all ſides, the emanations that may come either from his enemy or his prey, which he very nicely diſtinguiſhes. He prefers thoſe animals which he kills himſelf to thoſe he finds dead; and yet, he does not diſdain theſe, though ever ſo much infected, when no better is to be had. He is particularly fond of human fleſh; and, perhaps, if he had it in his power, he would eat no other. Wolves have been ſeen following armies, and arriving in numbers upon the field of battle, where they devoured ſuch dead bodies as were left upon the field, or but careleſsly buried. Theſe, when once accuſtomed to human fleſh, ſeek particularly to attack mankind, prefer the ſhepherd to his flock, and devour women, and carry off children. Theſe dreadful wolves are called *ware-wolves*,—that is, wolves of which we ought to be *aware*.

The colour of this animal differs according to the different climates in which it is bred, and often changes even in the ſame country. Beſide the common wolves which are found in France and Germany, there are others with thicker hair, inclining to yellow. In the northern climates, ſome are found quite black, and ſome entirely white. The former are larger and ſtronger than thoſe of any other kind.

The Fox.

This animal has always been famous for his artifices; and the reputation he has thus acquired, he partly merits. What the wolf cannot acompliſh but by his ſuperior ſtrength, the fox accompliſhes by his ſuperior cunning. Without attempting to oppoſe either the ſhepherd, his dog, or his flock, he finds an eaſier way to ſubſiſt. Patient and prudent, he waits the opportunity for depredation, and varies his conduct as he perceives that circumſtances vary. Though as indefatigable and more nimble than the wolf, he does not truſt entirely to the ſwiftneſs of his courſe, but contrives for himſelf an aſylum, to which he retires in caſes of neceſſity, and in which, ſheltered from danger, he brings up his young.

The fox generally fixes his reſidence at the edge of a wood, and yet not far removed from ſome cottage, or ſome hamlet. He liſtens to the crowing of the cock, and the cackling of other domeſtic fowls. Even at a conſiderable diſtance he ſcents them, and ſeizes his opportunity. If he be able to get into the yard, he begins by leveling all the poultry without remorſe. After this, he carries off a part of the ſpoil, hides it at ſome convenient diſtance, and again returns to the charge. Taking off another fowl in the ſame manner, he hides that alſo, though not in the ſame place; and in this manner perſeveres, till, warned by the approach of day, or the noiſe of the family, he finally retires. He practiſes the ſame arts when he finds birds entangled in ſprings laid for them by the fowler, whom the fox anticipating very expertly ſnatches the birds out of the ſnare, conceals them in different places, leaves them there ſometimes for two or three days, and is never at a loſs to recover his hidden treaſure. He is equally alert in ſeizing the young hares and rabbits, before they have ſtrength to eſcape him; and when the old ones are wounded and fatigued, he is ſure to ſeize them in the moments of diſtreſs. In the ſame manner he finds out the neſts of the partridge and the quail, and ſeizes the dam while ſitting.

The fox is ſo voracious, that, when he has no better food, he devours rats, mice, lizards, toads and ſerpents. Inſects and ſhell-fiſh ſometimes ſerve him for food. In vain does the hedge-hog roll itſelf up into a ball to oppoſe him. The waſp and the wild bee are attacked by him with equal ſucceſs. Though at firſt they fly out upon their invader, and actually oblige him to retire, yet this repulſe is but for a few minutes, till he has rolled himſelf upon the ground, and thus cruſhed ſuch as may have ſtuck to his ſkin. He then returns to the charge, and at length, by dint of perſeverance, obliges them to abandon their combs, which he greedily devours.

The young foxes are produced blind, like dogs. Like them, too, they are eighteen months or two years in reaching their full growth, and live about thirteen or fourteen years. The ſenſes of the fox are as good as thoſe of the wolf; his ſentiment is more acute, and the organ of his voice is more ſupple, and more perfect. The wolf is never heard but by dreadful howls, while the fox only yelps, barks, and ſends forth a moanful ſound, reſembling the cry of the pea-cock. His tones, too, are different, according to the different ſentiments with which he is affected. He has one ſound expreſſive of deſire, a ſecond of murmur, a third of ſorrow, and a fourth of pain. The latter is never heard from him, unleſs in the inſtant that he is wounded by a ſhot, and has loſt the uſe of ſome member; for, like the wolf, when attacked with cudgels alone, he never murmurs, but will defend himſelf with obſtinacy, and fight in ſilence to the laſt. He bites dangerouſly, and with ſuch determined fury, that, in order to make him relinquiſh his hold, ponderous wood, and even iron bars, are neceſſary.

The fleſh of the fox is not ſo bad as the fleſh of the wolf. Dogs, and even men, eat it in autumn, eſpecially if the animal has fed on grapes; and, in winter, good furs are made of his ſkin. He ſleeps ſo ſound, that, however cloſely approached, there is no great danger of awaking him. When he only means to reſt himſelf, he ſtretches out his hind legs, and remains flat upon his belly. In this poſture he watches for the birds as they perch on the hedges; who no ſooner perceive him than they give each other warning of their danger. The jackdaw and the magpie, in particular, often follow him to the diſtance of ſome hundred paces, ſtill towering beyond his reach, and with their cries, and notes of hoſtility, appriſe other animals to beware.

Of all wild animals, the fox is moſt ſubjected to the influence of climate; and there are found nearly as many varieties in this ſpecies, as in that of any domeſtic animal. The generality of the French foxes are red; of ſome, however, the hair is of a greyiſh caſt; and, of all, the tip of the tail is white. In the northern countries we find foxes of all colours.

The Badger.

The Badger is a lazy, diſtruſtful, ſolitary animal, that retires far from the approach of man, and digs a ſubterranean reſidence, where it ſpends, at leaſt, three fourths of its exiſtence, and never ventures forth but in ſearch of food. It burrows in the ground with particular eaſe, as its body is rather of an oblong form, and its claws, thoſe eſpecially of the fore feet, are long and compact. The hole which it thus forms to itſelf, is often at a very great diſtance from the ſurface of the earth, and the paſſage to it is always oblique and winding.

The fox, who is leſs expert at ſuch excavations, often appropriates to his own convenience the labours of the badger. Unable to compel him from his retreat by force, he often expels him by ſtratagem, often remains a fixed centinel at the mouth of the paſſage, and, as an infallible expedient, it is ſaid, emits his ordure. When the badger has left it, he immediately takes poſſeſſion of it, enlarges it, and accommodates it to his own purpoſe. Though forced to remove to another habitation, this animal does not remove to another country. At a little diſtance from its old burrow, it forms a new one, from which it never ſtirs but at night. The dogs eaſily overtake it, when it is at any diſtance from its hole; and then, exerting all its ſtrength, all its powers of reſiſtance, it throws itſelf upon its back, and defends itſelf with deſperate reſolution.

Several badgers have been brought to me, and ſome of them I kept a long time. The young ones are eaſily tamed; they will play with young dogs, and, like them, will follow any perſon whom they know, and from whom they receive their food; but the old ones, in ſpite of every effort, ſtill remain wild. They are neither miſchievous nor voracious, as the fox and the wolf are, yet they are carnivorous; and though raw-meat is their favourite food, yet they will eat any thing that comes in their way. They ſleep the greateſt part of their time, without, however, being ſubject, like the mountain-rat, or the dormouſe, to a torpor during the winter. Hence though they feed moderately, they are always fat.

They keep their hole exceedingly clean, nor are they ever known to void their ordure in it. The male is rarely to be found with the female.

In ſummer ſhe brings forth, and her uſual number is three or four at a birth. Theſe ſhe feeds at firſt with her milk, and afterwards with ſuch petty prey as ſhe can ſurpriſe. She ſeizes young rabbits in the warren, robs birds of their young, finds out where the wild bees have laid up their honey, where field mice, lizards, ſerpents, and graſshoppers,

ſhoppers, are to be met with; and carries all to her expecting brood, which ſhe frequently brings forward to the mouth of her hole.

Theſe animals are naturally of a chilly temperament. Such as are reared in a houſe ſeem never more happy than when near a fire. They are likewiſe very ſubject to the mange; and, unleſs carefully waſhed, the dogs that penetrate into their burrows are infected with the ſame diſtemper.

The hair of the badger is always filthy; between the anus and the tail there is an opening, which, though it has no communication with any interior part, and is hardly an inch deep, continually emits an oily liquid. This the animal is fond of ſucking. Its fleſh is not abſolutely nauſeous; and of its ſkin are made coarſe furs, collars for dogs, trappings for horſes, &c.

The Otter.

The Otter is a voracious animal which, more fond of fiſh than of fleſh, is ſeldom found but at the ſides of lakes and rivers. It ſwims with more facility than even the beaver. All the feet of the otter have membranes; and it can hardly walk faſter than it ſwims.

Accurately conſidered, the otter cannot be pronounced an amphibious animal. We even find them drowned when they happen to have been entangled in a net; and this evidently for want of having had time to deſtroy it, and thereby effect their eſcape. For want of fiſh, frogs, water-rats, or other nouriſhment, it will eat the young branches, and the bark, of aquatic trees; and in ſpring it will eat new graſs. Of cold it is as little afraid as of moiſture. It brings forth in the month of March. Three or four is the number generally produced at a birth.

The otter becomes induſtrious with age, and wages a ſucceſsful war againſt the tribes of fiſhes, which, with reſpect to inſtinct and ſentiment, are greatly inferior to other animals. It does not dig its own habitation, but fixes its reſidence in the firſt hole that offers, under the root of the willow or poplar-tree, in the clefts of rocks, and even among piles of floating wood; and there the female brings forth her young. It, however, frequently changes its reſidence; and diſperſes its young ones at the end of ſix weeks, or two months.

The Martin.

The generality of naturaliſts have conſidered the martin and the pine-weaſel as animals of the ſame ſpecies. They are, however, different both in diſpoſition and temperament. The pine-weaſel ſhuns open countries, confines itſelf to the boſom of the foreſt, fixes its reſidence upon ſome tree, and is never found in great numbers but in cold climates. The martin on the other hand, not only approaches human habitations, but even forms a reſidence for itſelf in old buildings, in hay-lofts, in holes of walls, and while the ſpecies is generally diffuſed in great numbers over all the temperate climates, it is not to be met with in the regions of the North.

The countenance of the martin is very ſharp; its eye is lively, its limbs are ſupple, its body is flexible, and all its movements are quick. It rather leaps and bounds than walks; and with great facility climbs walls, enters pigeon-houſes, and hen-houſes, devours the eggs, the pigeons, and the hens, as on other occaſions it does mice, rats, moles, and birds in their neſts.

This animal is ſaid to bring forth as often as the cat. The growth of the young ones is very quick; and hence it may be inferred, that it is an animal whoſe life does not exceed eight or ten years. Its ſmell, which is not abſolutely diſagreeable, is like that of counterfeit muſk. Both the martin and the pine-weaſel, as well as a number of other animals, have interior veſicles which contain a ſtrong-ſcented ſubſtance like that of civet.

The Pine-Weaſel.

The pine-weaſel, is originally a native of the north, and is in a manner peculiar to that climate, where they are ſo numerous, that the quantity of furs produced from them, and carried into foreign countries, is aſtoniſhing. In temperate climates, on the contrary, it is rarely, and in warm climates never, to be found. There are ſome in Burgandy, and ſome in the foreſt of Fontainbleau; but in general they are as ſcarce in France as the martin is common. There are none in England, becauſe in that country there are no very extenſive woods.

Alike averſe to open countries, and to countries which are inhabited, it remains in the boſom of ſome foreſt, ranges through the labyrinths of the thicket, or towers aloft upon the branches of the trees. It ſubſiſts by the chace, and deſtroys a prodigious quantity of birds. Of the ſquirrel, the dor-mouſe, &c. it alſo makes a prey; and it is known to eat honey as well as the martin.

Its neck is yellow, whereas that of the martin is white; and its hair, at the ſame time, is much finer, thicker, and leſs ſubject to ſhed.

When the female is near her time, her cuſtom is to climb to the neſt of ſome ſquirrel, to drive her from it, to enlarge it for her own purpoſe, and to bring forth her young in it. In the ſame manner, ſhe occupies the old neſts of the owl and the buzzard, as alſo the hollow places of trees, from which ſhe preſently diſlodges the wood-pecker, and other birds.

The Pole-Cat.

The pole-cat is ſomewhat ſmaller than the martin. Its tail is ſhorter, its ſnout ſharper, and its hair thicker and blacker. It has ſome white on its forehead, and about the noſe and mouth. It differs likewiſe in its voice; the cry of the martin being rather ſharp and loud, that of the pole-cat deeper and more hollow. The pole-cat, however, does not at all reſemble the martin in ſmell, which, in the former is perfectly fetid. When heated or enraged eſpecially, it emits a ſtench that is abſolutely intolerable. The dogs will not eat its fleſh; and even its ſkin, though good in itſelf, ſells at a very low price, as it can never be entirely diveſted of its natural odour.

The Ferret.

It has been doubted by ſome whether or not the ferret and the pole-cat were animals of two different ſpecies. Perhaps, the reſemblance there ſometimes is in the colour of their hair firſt gave riſe to this doubt. The pole-cat, nevertheleſs, a native of temperate climates, is an animal wild like the martin; whereas the ferret, originally an inhabitant of hot countries, cannot exiſt in France, unleſs as a domeſtic animal. The ferret alſo, and not the pole-cat, is made choice of to drive the rabbits from their burrows, chiefly becauſe it is more eaſily tamed. The ferret has a longer and thinner body, a narrower head, and a ſharper ſnout, that the pole-cat. It has not the ſame ſagacity in providing for its ſubſiſtence; it cannot exiſt, at leaſt in our regions, without the care of man, nor have ſuch of the ſpecies as have been loſt in the burrows of rabbits, been ever known to multiply in the country; but have, on the contrary, periſhed, to all appearance, by the ſeverity of the winter.

This animal is an enemy to the rabbit. If even a dead one is preſented to a young ferret which had never ſeen one before, it ſprings at it, and tears it with fury; if it be a living one, it ſeizes it by the neck and noſe, and inſtantly begins to ſuck its blood. When the ferret is let looſe into the burrows of the rabbits, it is neceſſary to muzzle him, that he may not kill them, but only make them to run out, and thereby fall into the net laid for them at the entry. If he is allowed to go unmuzzled, there is a riſque of loſing him, becauſe, after having ſucked the blood of the rabbit, he will fall aſleep. Beſides the ſmoke which is raiſed at the mouth of the burrow does not always prove a ſufficient expedient for bringing him back, as there are often more iſſues than one, and one burrow generally communicates with others.

The Weaſel.

The common weaſel is as frequent in temperate and in hot countries, as it is rare in cold ones. Though of the ſame ſpecies, it is in many reſpects different from the ermine, which is a native of the north.

When a weaſel enters a hen-rooſt, it never meddles with the cocks or the old hens. It makes choice of the pullets, the young chickens, all of which he kills with a ſingle ſtroke on the head, and carries away one after another. It alſo deſtroys the eggs, and ſucks them with incredible avidity. In winter it generally reſides in ſome granary, or hay-loft; where the female often continues even in the ſpring, in order to bring forth her young among the hay or ſtraw. During this time the weaſel makes war with the rats and mice with more ſucceſs than the cat; for it follows them into all their holes, and prevents their eſcape. It alſo climbs up to the pigeon-houſes, to the neſts of ſparrows, &c. and commits great havock. In ſummer, it removes to ſome diſtance from the houſes, always chuſing the lower countries about the mills and ſtreams, hiding itſelf among the buſhes, in order to catch birds, and not unfrequently taking up its habitation in the hollow of an old willow. The female generally brings forth four or five. The young ones come forth with their eyes ſhut, but in a little time they attain a ſufficiency of growth and ſtrength to follow their dam to the chace. They attack adders, water rats, moles, field-mice, &c. and, traverſing the meadows, devour quails and their eggs.

Like the pole-cat and the ferret, theſe animals have ſo ſtrong a ſcent that they cannot be kept in any place that is inhabited. As their own ſmell is very bad, they ſeem to ſuſtain no inconvenience from any foreign ſtench or infection. A peaſant in my neighbourhood took, one day, three weaſels newly brought forth, in the carcaſe of a wolf which had been ſuſpended by its hind-legs from one of the branches of a tree; and though the wolf was almoſt entirely rotten, the old weaſel, brought graſs, ſtraw, and leaves, in order to make a bed for her young ones in the cavity of the thorax.

The Ermine, or Stoat.

The weaſel with a black tail is called the ermine when it is white, and the ſtoat when it is red or yellowiſh. Though it is a leſs common animal than the weaſel, yet there are numbers to be found in the old foreſts, and ſometimes during the winter in the neighbourhood of woody grounds. It is always eaſy to diſtinguiſh it from the common weaſel, becauſe the tip of its tail is always of a deep black, while the edge of its ears, and the extremities of its feet are white.

CHAP. XII.

OF CERTAIN SMALLER ANIMALS OF THE CARNIVOROUS CLASS—THE SQUIRREL—THE RAT—THE MOUSE—THE LONG-TAILED FIELD-MOUSE—THE WATER-RAT—THE SHORT-TAILED FIELDMOUSE—THE GUINEA-PIG—THE HEDGE-HOG—THE SHREW-MOUSE—THE WATER-SHREW-MOUSE—THE MOLE—THE BAT—THE FAT SQUIRREL—THE GARDEN-SQUIRREL, OR GREATER DORMOUSE—THE DORMOUSE—THE BROWN RAT—THE MARMOT.

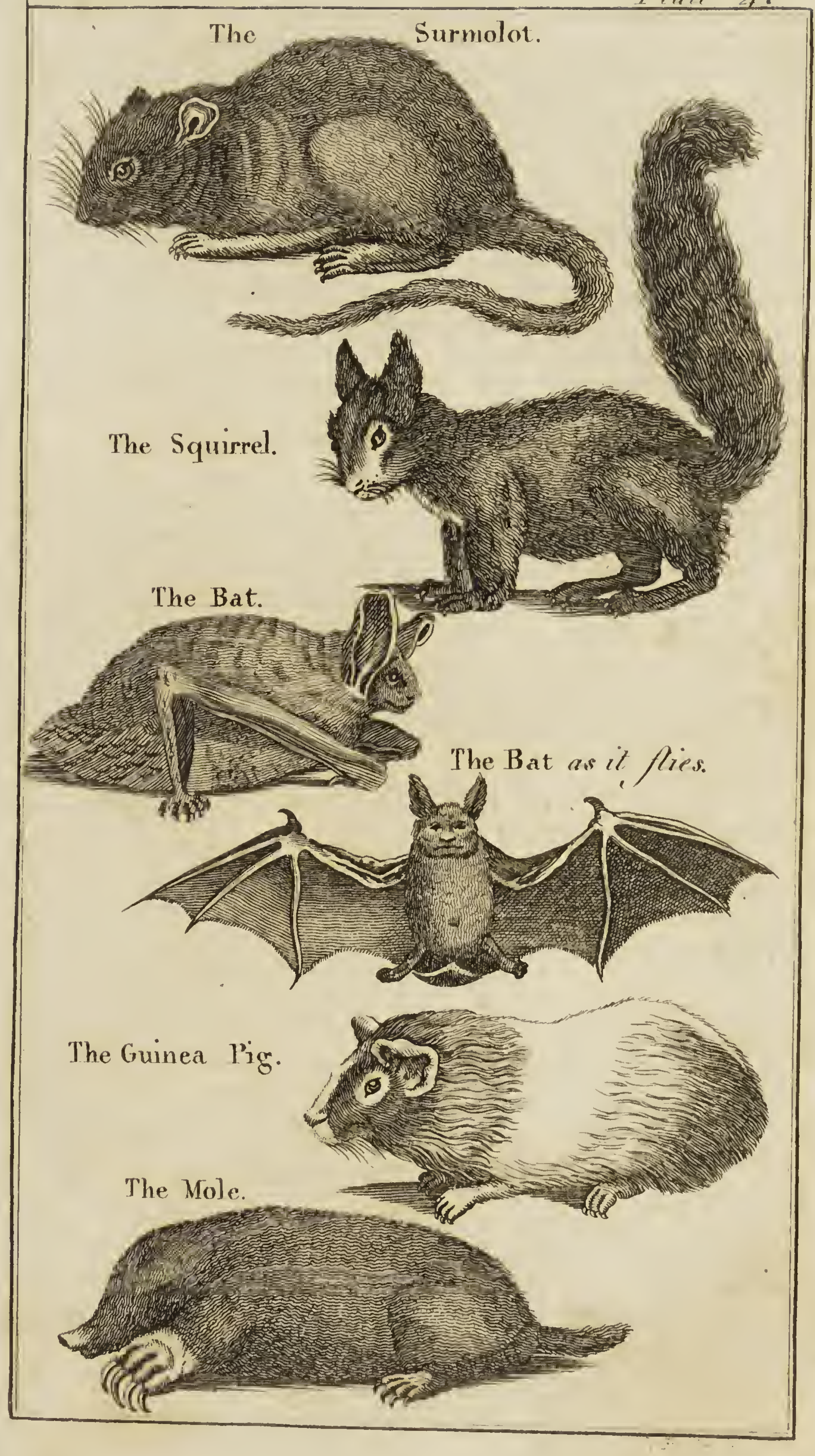
THE Squirrel is a beautiful little animal, which is only half-wild, and which, by its gentleneſs, its docility, and even the innocence of its manners, might deſerve to be exempted from the preſent claſs. It is neither a carnivorous nor an injurious animal, though it ſometimes ſeizes on birds; its general food conſiſting of fruit, almonds, hazle-nuts, beech-maſt, and acorns. It is neat, cleanly, alert, lively, and induſtrious. Its eyes are full of fire, its countenance is ſharp, its body is nervous, and its limbs are ſupple.

The beauty of its form is farther embelliſhed by a ſpreading tail, in ſhape like a plume of feathers, which it raiſes above its head, and forms into a kind of ſhade for itſelf.

The ſquirrel may be ſaid to be leſs a quadruped than almoſt any other four-footed animal. It generally holds itſelf almoſt upright, uſing its fore feet as hands for a conveyance to its mouth. Inſtead of hiding itſelf in the earth, it is continually in the air. It ſomewhat reſembles the birds by its lightneſs and activity; like them, it reſts upon the branches of trees; leaping from one to the other, and in the higheſt of them builds its neſt. It avoids the water ſtill more than the earth; and it is even aſſerted of this animal, that, when it is obliged to croſs a river or ſtream, it uſes the bark of a tree, or ſome ſuch light woody ſubſtance, as a boat, while its tail ſupplies the place of ſails, and of a rudder. It collects a quantity of nuts during the ſummer, which it depoſits in the hollow part of ſome old tree, and to which it has recourſe for proviſion in winter; and ſuch is the agility of its body, that it will, in an inſtant, climb the moſt ſmooth beech-tree.

There are many ſpecies which approach to that of the ſquirrel, though there are few varieties in the ſpecies itſelf. There are ſome of an aſh-colour, and all the reſt are red. The ſmall grey ſquirrel is of a different ſpecies, and remains always grey. The flying ſquirrels, are very different from the reſt. The white ſquirrel of Cambaye, is very ſmall, and

Plate 4.


The Surmolot.
The Squirrel.
The Bat.
The Bat *as it flies.*
The Guinea Pig.
The Mole.

and has a tail like that of the European ſquirrel. That of Madagaſcar, called *Tſitſihi*, is grey, and according to Flaccourt is neither handſome nor fit to be tamed. The white ſquirrel of Siam; the grey, and ſpotted, ſquirrel of Bengal; the ſtreaked ſquirrel of Canada; the black ſquirrel; the large grey Virginian ſquirrel; the white-ſtripped ſquirrel of New Spain, the white Siberian ſquirrel; the variegated ſquirrel; the little American ſquirrel; that of Braſil; that of Barbary; the *palmiſt*, &c. form ſo many ſpecies diſtinct from that which we have deſcribed.

The Rat.

If we deſcend by degrees from the great to the ſmall, from the ſtrong to the weak, we ſhall find, that Nature, attentive only to the preſervation of each ſpecies, creates a profuſion of individuals, and is ſupported by the numbers which ſhe has formed of a diminutive ſize, and to which ſhe has denied weapons, ſtrength and courage.

Under the generical name of rat, ſeveral ſpecies of ſmall animals have been compriſed. This name we ſhall ſolely appropriate to the common rat, which is of a dark colour, and infeſts our houſes. Each of the other ſpecies ſhall have its particular denomination; for, as neither of them couple together, each is, different from all the reſt.

This animal is carnivorous, and we may uſe the expreſſion *omnivorous*. Hard ſubſtances, however, it prefers to ſoft ones. It devours wool, ſtuffs, and furniture of all ſorts; eats through wood, makes hiding-places in walls, from whence it ſallies forth in queſt of prey, and frequently returns with as much as it is able to drag along with it, forming, eſpecially when it has young ones to provide for, a magazine of the whole. The females bring forth ſeveral times in the year, though moſtly in the ſummer ſeaſon; and they uſually produce five or ſix at a birth.

In defiance of the cats, and notwithſtanding the poiſon, the traps, and every other method that is uſed in deſtroying theſe creatures, they multiply ſo faſt as frequently to do conſiderable damage. In old houſes, in the country eſpecially, where great quantities of corn are kept, and where the neighbouring barns and hay-ſtacks favour their retreat, as well as their multiplication, they would often become dangerouſly numerous, were they not to devour each other. This we have often found to be the caſe when they have been ſtraitened for proviſions; and the method they take to leſſen their numbers, is, for the ſtronger to diſpatch the weaker. After this, they lay open their ſkulls, and firſt eat up the brains, and afterwards the reſt of the body. Next day, hoſtilities are renewed in the ſame manner; nor do they ſuſpend their havock till the majority are deſtroyed. Hence it is, that, after any place has for a long time been infeſted with rats, they often ſeem to diſappear of a ſudden, and ſometimes for a conſiderable while.

The female always prepares a bed for her young, and provides them immediately with food. On their firſt quitting the hole, ſhe watches over, defends, and will even fight the cats, in order to protect them. The weaſel, though a ſmaller animal, is, however, a ſtill more formidable enemy than the cat. The rat cannot inflict any wounds but by ſnatches, and with its fore-teeth, which, however, being rather calculated for gnawing than for biting, have but little ſtrength. The weaſel, on the other hand, bites fiercely with the force of its whole jaw at once, and, inſtead of letting go its hold, ſucks the blood through the wound.

In every conflict with an enemy ſo dangerous, it is no wonder, therefore, that the rat ſhould fall a victim.

There are many varieties in this ſpecies. Beſide the common black rat, there are ſome which are brown, and ſome almoſt black; ſome which are grey, inclining to white or red, and ſome perfectly white. The white rat, like the white mouſe, the white rabbit, and all other animals which are entirely of that colour, has red eyes. The white ſpecies, with all its varieties, appears to belong to the temperate climates of our continent, and are found in greater numbers in hot countries than in cold ones. Originally they had no rats in America; and thoſe which are to be found there at preſent, are the produce of rats which accidentally obtained a footing on the other ſide of the Atlantic with the firſt European ſettlers. Of theſe the increaſe was ſo great, that the rat was long conſidered as the peſt of the colonies; where, indeed, it had hardly an enemy to oppoſe it but the large adder, which ſwallows it up alive. The European ſhips have likewiſe carried theſe animals to the Eaſt Indies, into all the iſlands of the Indian Archipelago, as well as into Africa, where they are found in great numbers. In the North, on the contrary, they have hardly multiplied beyond Sweden; and thoſe which are called Norwegian and Lapland rats, are animals different from ours.

The Mouſe.

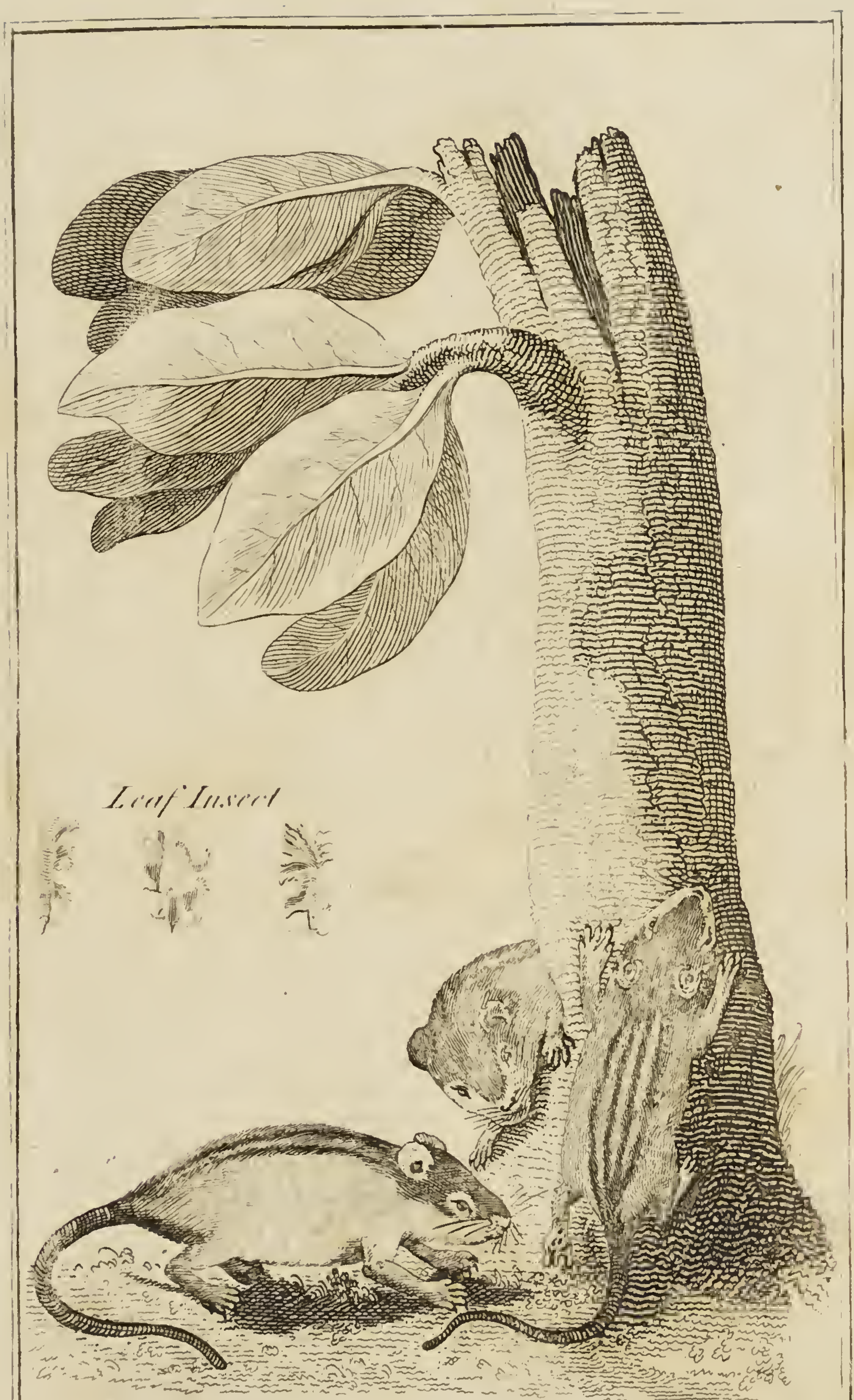
The Mouſe is an animal ſmaller than the rat. Its inſtinct, its temperament, its diſpoſition, is the ſame; nor does it materially differ from the rat, but by its weakneſs, and the habits which it contracts from that circumſtance. By nature timid, by neceſſity familiar, its *fears* and its *wants* are the ſole ſprings of its actions. It never leaves its hiding-place but to ſeek for food; nor does it, like the rat, migrate from one houſe to another, unleſs compelled by neceſſity. Its manners are milder; and, to a certain degree, it may be tamed. It is, however, utterly incapable of attachment.

If it were not its immenſe fecundity, the ſpecies of the mouſe could not ſubſiſt. Even in mouſe-traps I have known them to bring forth. They produce at all ſeaſons, and ſeveral times in the year. Their uſual number at a birth is five or ſix, which, in leſs than fifteen days, attain ſtrength ſufficient to ſhift for themſelves. As in theſe reſpects they ſo ſoon attain perfection, ſo the duration of their life muſt be very ſhort; a circumſtance which cannot but heighten our idea of their prodigious multiplication. Ariſtotle tells us, that, having put a pregnant mouſe into a veſſel of corn, he ſoon after found in it one hundred and twenty mice.

The Long-tailed Field-Mouſe.

The Long-tailed Field Mouſe is ſmaller than the rat, but larger than the common mouſe, and does not live in houſes. It is remarkable for the largeneſs and prominence of its eyes. It differs too both from the rat and the mouſe in the colour of its ſkin, which, while it is tolerably white under the belly, is of a reddiſh brown upon the back. The ſpecies is generally and abundantly diffuſed.

The largeſt are above four inches from the tip of the noſe to the root of the tail; and the ſmalleſt, which appear to be full grown as well as the others, are an inch ſhorter. Although many are found of



Dwarf Mice

different intermediate ſizes, the larger and the ſmaller are all of the ſame ſpecies.

Theſe creatures are fond of dry and elevated grounds. In woods, and in the fields adjoining to them, they are to be ſound in great numbers. They conceal themſelves in holes, which they either find already made, or which they make for themſelves, under buſhes, or the trunks of hollow trees. In theſe they amaſs ſo prodigious a quantity of acorns, nuts, &c. that in one hole there has been found a buſhel at a time.

Theſe holes are generally more than a foot under ground, and often divided into two cells, of which the one ſerves for an habitation for itſelf and its young ones, and the other for a granary. I could never find any other method of preventing their ravages, than that of ſetting traps at every tenth pace through the whole extent of each piece of new-ſown land.

The Water-Rat.

The Water-Rat is a little animal, about the ſize of a common rat, but in its nature and habits it is more like the otter than the rat. Like the otter, it frequents the freſh waters, and is generally found on the borders of rivers, rivulets and ponds. Like that creature, too, it ſeldom feeds but upon fiſh, or the ſpawn of fiſh, though ſometimes it eats frogs, water-inſects, and even roots and herbs. This animal is not web-footed; but, though every toe of its feet is ſeparated, it ſwims with eaſe, keeps itſelf a long time above water, and thence carries off its prey.

The head of the water-rat is ſhorter, the noſe broader, the hair more erect, and the tail much longer than that of the land rat. Like the otter, it flies from large rivers, or rather from thoſe which are too much frequented, and is never found either in houſes or in barns.

It is probable, that theſe animals bring forth often in a year; but of this we have no certain information. Their fleſh is not abſolutely bad; and, in Catholic countries, the peaſants eat it during Lent, as they do that of the otter. The ſpecies is to be found throughout Europe, the extremities of the North excepted.

The Short-tailed Field-Mouſe.

The ſhort tailed Field-mouſe is ſtill more generally diffuſed than the long-tailed kind, and is found almoſt every where; in woods, in meadows, and even in gardens. It is remarkable for the thickneſs of its head, and the ſhortneſs of its tail, which is not above an inch long. It forms holes in the earth, where it hoards up corn, nuts, and acorns; the former of which it prefers to every other kind of food. About the month of July, when the corn begins to ripen, they flock together from every quarter, and frequently do great damage, by cutting the ſtalk in order to come at the ear. In autumn and winter, the greater part of them retire to the woods, where they find beech-maſt, nuts and acorns. Some years they appear in ſuch numbers, that they would deſtroy every thing, were they to ſubſiſt long. For want of other food, however, they often eat one another, and are themſelves the uſual prey of the fox, the wild-cat, the martin, the weaſel, and of the long-tailed field-mouſe.

The Guinea-Pig.

The Guinea-Pig, though originally a native of the warm climates of Braſil and Guinea, lives, however, and breeds in temperate and even in cold countries, provided it is properly taken care of. Its ſkin is of little or no value; and the fleſh, though people may eat it, is very indifferent food. Their fleſh, however might be rendered better, if they were reared in warrens, and had a proper choice of herbs.

The growth of theſe animals is not entirely completed till the end of eight or nine months. The female never goes with young above three weeks; and ſhe has been known to bring forth when only two months old. The firſt litter does not amount to more than four or five. The ſecond amounts to five or ſix, and the reſt to ſeven or eight, and even to ten or eleven. She does not ſuckle her young above twelve or fifteen days. In one year a thouſand might be obtained from a ſingle couple, did they not frequently deſtroy each other, and periſh from the cold and wet.

The guinea-pig feeds on all ſorts of herbs, and eſpecially on parſley, which it prefers even to bran, flour, or bread. Of apples and other fruits it is alſo exceedingly fond. Like the rabbit, it eats quickly, little at a time, but very often. It grunts ſomewhat like a young pig.

Theſe animals are ſo delicate, that it is with difficulty they ſurvive the rigours of winter. When they feel cold, they aſſemble together, preſs cloſe to one another, and in this ſituation are frequently found dead.

The Hedge-Hog.

The Hedge Hog has the power of defending itſelf from an enemy without combating him, and of annoying without attacking him. Poſſeſſed of little ſtrength, and of no agility, by which it might eſcape its foes, it has received from Nature a prickly armour, with a facility of rolling itſelf up in a ball, and of preſenting from every part of its body a poignant weapon of defence. Even from its fear this animal obtains another engine of ſecurity. The ſmell of its urine, which, when attacked, it generally emits, is ſufficient to make its enemy quit the field. Thus the generality of dogs are content with barking at the hedge-hog, when it falls in their way, without diſcovering any inclination to ſeize it. Of theſe, however, there are ſome which, like the fox, have had the addreſs to overcome it, though of the martin, the pole-cat, the ferret, the weaſel, or any of the birds of prey, it has no dread.

They are generally found in woods, under the trunks of old trees, as alſo in the clefts of rocks. I do not believe that they climb up trees, as ſome naturaliſts have affirmed, or that they make uſe of their prickles to carry off the fruit. It is with their mouth they ſeize it; and though they are very numerous in our foreſts, yet I have never ſeen one of them upon a tree. They always remain at the foot, in ſome hollow ſpace, or under moſs. They continue in a ſtate of inactivity during the whole day; and they only venture abroad by night, but ſeldom approach human habitations. They ſleep during the winter; and therefore every thing that has been ſaid of their hoarding up proviſions for that ſeaſon muſt be falſe. They never eat much, and can ſubſiſt very long without any food whatever. Like that of all other animals which become torpid in winter, their fleſh is not proper food; nor is their ſkin of any uſe.

The Shrew-Mouſe.

The Shrew-Mouſe ſeems to fill up the vacuum between the rat and the mole. The ſhrew-mouſe is ſmaller than the domeſtic mouſe, and reſembles the mole in its ſnout, which is longer than its jaw-bones. Its eyes, though larger than thoſe of the mole, are, in like manner concealed, and much ſmaller than thoſe of the domeſtic mouſe. The number of its claws, of which it has five to each foot; its tail, and its legs, particularly the hind ones, which are ſhorter than thoſe of the domeſtic mouſe; its ears, too, and its teeth, reſemble thoſe of the mole.

This diminutive creature has a ſtrong ſmell peculiar to itſelf, and ſo offenſive to cats, that, though they will chearfully kill the ſhrew-mouſe, they will not eat it. It is evidently this noiſome odour, this averſion of the cat to it, that gave riſe to the notion, that the ſhrew-mouſe is a venomous animal, and that its bite is ſo dangerous to every kind of cattle and particularly to horſes. The truth, however, is, that it is neither venomous nor capable of biting; for it cannot open its mouth wide enough to ſeize the double thickneſs of the ſkin. The diſtemper among horſes, which the vulgar attribute to the tooth of the ſhrew-mouſe, is a ſwelling which proceeds from an internal cauſe, and has no connection with any bite, or rather ſcratch, that this little animal may give.

In winter eſpecially, the ſhrew-mouſe generally fixes its reſidence in ſome hay-loft, ſtable, or barn, where it feeds on grain, inſects, and putreſied fleſh. It is likewiſe found in woods and fields, where, living on corn, it ſometimes conceals itſelf under moſs or leaves, ſometimes under the trunks of trees, ſometimes in holes abandoned by moles, and ſometimes in holes of a ſmaller ſize, which it forms for itſelf by digging with its claws and ſnout.

The ſhrew-mouſe, is ſaid to produce as many at a birth as the domeſtic mouſe, though leſs frequently. It has a ſqueak much more piercing than the latter. In point of nimbleneſs, however, it is far inferior; and as it both ſees imperfectly, and runs ſlowly, it is eaſily taken.

The uſual colour of theſe creatures is brown with a mixture of red. Others of them there are aſh-coloured; and they all have a greater or leſs degree of whiteneſs upon the belly. They are very common throughout Europe; but they do not ſeem to have obtained a footing in America.

The Water Shrew Mouſe.

The Water Shrew-Mouſe, though a native of theſe regions, was unknown to any of our naturaliſts till M. Daubenton firſt diſcovered it. With reſpect to the *water ſhrew-mouſe*, it is taken at the ſources of fountains in the morning and evening, as the ſun riſes and ſets. In the day-time it remains concealed in the clefts of rocks, or in holes under ground, near the edges of rivulets. It brings forth in ſpring, and generally produces nine young ones at a time.

The Mole.

The Mole, without being blind, has ſuch ſmall eyes, and theſe ſo concealed, that they prove but of little uſe to it. It enjoys however the ſenſes of hearing and feeling in an eminent degree. Its ſkin is ſoft as ſilk; and its little paws, which are furniſhed with five claws, are very different from thoſe of other animals, and almoſt like the hands of a human being. Proportioned to the ſize of its body, its ſtrength is great; it poſſeſſes the mild habitudes of repoſe and of ſolitude; the art of ſecuring itſelf, of forming, inſtantaneouſly, as it were, an aſylum to itſelf, of extending it, and of obtaining, without the neceſſity of relinquiſhing it, an abundant ſubſiſtence.

The mole ſhuts up the entry to is retreat, which it ſeldom deſerts, unleſs forced to it by heavy rains in ſummer. It is fond of cultivated grounds, and is never to be found in thoſe which are either muddy, hard, compact, or ſtony. It requires a ſoft ſoil, well ſupplied with eſculent roots, and with inſects and worms, of which, indeed, its principal nouriſhment conſiſts.

As theſe animals very ſeldom come above ground, they have but few enemies; and very readily evade the purſuit of animals ſtronger and ſwifter than themſelves. The chief calamity which befals them is an inundation; and when this happens, they are ſeen in numbers attempting to ſave themſelves by ſwimming, and uſing every effort to reach the higher grounds. The greateſt part, however, periſh, as well as their young, which remain in the holes behind. Were it not for ſuch accidents, from their great fecundity, they would become extremely troubleſome. They generally have four or five at a time; and it is eaſy to diſtinguiſh among other mole-hills, that in which the female has brought forth her young. Theſe are made with much greater art than the reſt; and are uſually larger and more elevated. I am apt to think that they produce oftener than once a year. Of this I am certain, that moles newly produced are found from the month of April to the month of Auguſt; a circumſtance which, however, may be owing to their having been engendered ſooner or later in the year.

The hole in which they produce their young is formed with ſingular ſkill, and merits a particular deſcription. The female begins by erecting the earth into a ſpacious apartment ſupported within by partitions at proper diſtances, to prevent the roof from falling. As the hillock, in which the apartment is thus formed, is raiſed above ground, the appartment itſelf is conſequently above the level of the plain, and therefore leſs ſubject to accidental ſlight inundations. The place being thus fitted, ſhe procures graſs and dry leaves, as a bed for her young. There they lie ſecure from wet, and ſhe continues to make their retreat equally free from danger. For round this hill of her own raiſing, are holes running into the earth, which part from the middle apartmant, like rays from a center, and extend about fifteen feet in every direction. Theſe reſemble ſo many walks or chaces, into which the animal makes her ſubterraneous excurſions, and ſupplies her young with ſuch roots or inſects as ſhe can provide. Beſides they contribute much to the general ſafety; for as the mole is very quick of hearing, the inſtant ſhe preceives her little habitation attacked, ſhe takes to her burrow, and unleſs the earth be dug away by ſeveral men at once, ſhe and her young always make good a retreat.

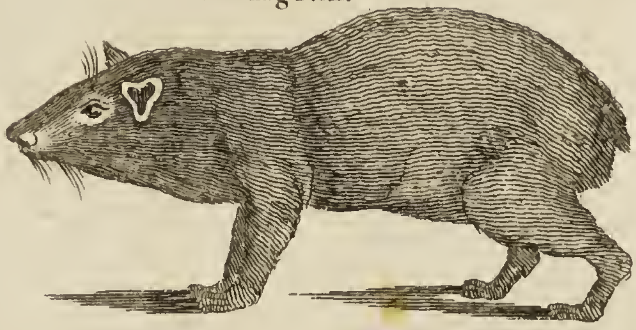
Some authors have ſaid, but without foundation, that the mole and the badger ſleep the whole winter. That this is not true of the badger, we have already obſerved. And as a proof that the mole quits its hole in winter as well as in ſummer, we have only to view the traces it leaves upon the ſnow. The mole is ſo far from ſleeping during the winter, that it continues its ſubterranean operations then as well as in ſummer; and the peaſants of France even proverbially remark, that "when the moles are at work, a thaw is at hand." They are indeed fond of warm places; and the gardeners often catch them round their hot beds in the months of December, January, and February.

The Bat.

An animal, which, like the bat, is half-quadruped and half-bird, and which, in fact, is neither the one nor the other, is a kind of monſter,

Plate 16.

The Agouti.



The Unan.

The Brown Bat.

The Red Bat.

J. Fraſer, Sc.

ſter. In the bat, the fore-feet are, properly ſpeaking, neither wings nor feet, though the animal uſes them both for the purpoſe of flying, and walking. They are, in fact, two ſhapeleſs extremities, of which the bones are of a monſtrous length, and connected by a membrane, neither with feathers, nor hair. They are a kind of winged paws, of which we only ſee one claw about the length of an inch, and of which the other four claws, though very long, cannot act but in conjunction, and have no peculiar movements, no ſeparate functions. They are a kind of hands ten times larger than the feet, and, in all, four times longer than the whole length of the body of the animal. In ſhort they are parts which have rather the appearance of a capricious and accidental, than of a regular and determined production.

To theſe incongruities, theſe diſproportions of the body and members, may be added the ſtill more ſtriking deformities of the head. In ſome ſpecies, the noſe is hardly viſible, the eyes are ſunk near the tip of the ear, and are confounded with the cheeks. In others, again, the ears are as long as the body, or elſe the face is twiſted into the form of an horſe-ſhoe, and the noſe covered with a kind of cruſt. Averſe, likewiſe, to the ſociety of all other creatures, they ſhun the light, inhabit none but dark and gloomy places, to which, after their nocturnal excurſions, they are ſure to return by break of day, and in which they remain, fixed, as it were, to the walls till the approach of night.

Their motion in the air may be termed an uncertain flutter, which they ſeem to execute by ſtruggles, and in an awkward manner. They raiſe themſelves from the ground with difficulty, never ſoar to a great height, and are but imperfectly qualified to accelerate, or even to direct their flight. This, far from being either rapid, or very direct, is performed by haſty vibrations in an oblique and winding direction; and in paſſing along they do not fail to ſeize all the gnats, moths, and other nocturnal inſects that come in their way. Theſe they ſwallow entire; and in their excrements we meet with the remains of wings and other dry parts, which they have not been able to digeſt. Like quadrupeds, the bat brings forth her young alive, and like them it has teeth and nipples.

Theſe animals do not produce more than two at a birth, which they ſuckle, and even carry along with them as they fly. They unite in numbers to defend each other from the cold. They paſs the winter without awaking, without ſtirring, and without eating, from the end of autumn till ſpring. Notwithſtanding they can more eaſily ſupport hunger than cold, and can even ſubſiſt a number of days without food, they belong to the number of carnivorous animals; for they will devour bacon and meat of all kinds.

The Fat Squirrel.

Of this animal we know three ſpecies, which, like the marmot, ſleep during the winter; namely, the fat ſquirrel, the garden ſquirrel and the dor-mouſe. Many authors have confounded theſe ſpecies together, though they are all three very different, and of conſequence eaſily known and diſtinguiſhed.

The fat ſquirrel is nearly of the ſize of the common ſquirrel, and, like it, its tail is covered with long hair. It is without foundation that theſe animals have been ſaid to ſleep during the winter. They are not in a ſtate of natural ſleep at this period. They are in a torpor, which is produced by the coldneſs of the blood, and by which they loſe the uſe of their members and ſenſes. Their internal heat is indeed ſo ſmall, that it hardly exceeds that of the temperature of the air. When the heat of the air is at ten degrees above the freezing point of the thermometer, the heat of theſe animals is alſo at ten degrees. Now it is well known, that the internal heat of man, and of the moſt of animals, always exceeds thirty degrees; there is little reaſon therefore to wonder that theſe animals, ſo inferior comparatively to all others in point of heat, ſhould become torpid as ſoon as their own little quantity of internal heat ceaſes to be aſſiſted by the external heat of the air. This circumſtance, however, naturally happens when the thermometer is not more than ten or eleven degrees above congelation. This is the real cauſe of the torpor of theſe animals; a cauſe of which naturaliſts have not been appriſed, and which, nevertheleſs, extends to all animals that ſleep during the winter.

This torpor continues as long as the cauſe which produces it continues to operate, and ceaſes when the cold ceaſes. A few degrees of heat above the tenth or eleventh degree are ſufficient to re-animate theſe creatures; and if they are kept in a very warm place during the winter, they do not become torpid.

Though in this torpid ſtate, they are without the ſmalleſt motion, though their eyes are ſhut, and they ſeem to be deprived of all uſe of the ſenſes, they yet feel pain when it is very acute. This they teſtify by a movement of contraction, as alſo by a little hollow cry, which they even repeat ſeveral times. I am inclined to believe, that it is not from a too great waſte of ſubſtance that they periſh in long winters, ſince in autumn they are exceſſively fat, and on their reviving in ſpring, they are found to have ſtill remained ſo. This abundance of fat is an internal nouriſhment which is ſufficient to ſupport them, and to ſupply what they loſe by perſpiration.

The fleſh of the fat ſquirrel is not unlike that of the guinea-pig. They were conſidered as a luxury by the Romans, who reared great numbers of them. Like the common ſquirrel, this animal lives in foreſts, climbs to the tops of trees, and leaps from branch to branch. This it does leſs nimbly indeed than the ſquirrel, whoſe legs are longer, whoſe belly is by no means ſo big, and which is remarkable for being meagre. Nuts, however, and other wild fruits, form its uſual nouriſhment. It likewiſe eats little birds which it takes in the neſts. It does not, like the ſquirrel, neſtle in the upper parts of trees, but makes a bed of moſs for itſelf in the trunks of thoſe which are hollow. It alſo ſhelters itſelf in the clefts of rocks, and always ſhews a preference for dry places. It avoids moiſture, it drinks little, rarely deſcends to the ground, and, unlike the ſquirrel, which is eaſily tamed, remains always wild. The ſpecies is very generally diffuſed, but there are few or none of them in England.

The Garden Squirrel, or Greater Dormouſe.

The fat ſquirrel frequents the foreſts, and ſeems to ſhun our habitations. The garden ſquirrel, on the contrary, inhabits our gardens, and is ſometimes in our houſes. The ſpecies of the latter is alſo more numerous and more generally diffuſed.

Theſe animals neſtle in the holes of walls, climb up trees, ſelect the beſt fruits, and gnaw them as they begin to ripen. They climb up pear, apricot, and other trees; and in a ſcarcity of other fruit, they eat almonds, nuts, and even leguminous roots. Theſe they carry in great quantities to their holes, where they make a bed of herbs, moſs, and leaves. The cold ſtupefies, the heat revives them; and ſometimes there are eight or ten found in one place, all in a ſtate of torpor, all huddled together, and rolled up in a ball, in the midſt of their hoard of proviſions. Their fleſh is not palatable, and has even the diſagreeable ſmell of the houſe-rat.

This animal is to be found in all the temperate climates of Europe, and even in Polland, and in Pruſſia; but it does not appear that there are any in Sweden, or in any of the more northern countries.

The Dormouſe.

Of all the rat ſpecies, the dormouſe is the leaſt ugly. Its eyes are ſparkling, its tail is tufted, and its hair is rather fair than red. It never lives in houſes. It is ſeldom to be found in gardens, but chiefly frequents the woods, where it finds a ſhelter in the hollow of ſome old tree.

The ſpecies is by no means numerous, yet they ſeem to be tolerably common in Italy, and to be known even in the northern climates; but it does not appear to be an Engliſh animal; for Ray, who had ſeen it in Italy, obſerves, that the ſmall dormouſe which is found in England, is not red upon the back like the Italian, and that it probably belongs to another ſpecies.

The dormouſe becomes torpid by the cold, and rolls itſelf up in a ball; it revives in mild weather, and hoards up nuts and other dry fruits for future ſuſtenance. It forms its neſt in trees, like the ſquirrel, though generally in a lower ſituation, among the branches of a nut tree, in a buſh, &c. The neſt is compoſed of herbs interwoven, and is about ſix inches in diameter, has no aperture but at the top, and contains three or four young ones.

The Brown Rat.

The brown rat is both ſtronger and more miſchievous than the black rat. It has a reddiſh ſkin, a long tail without hair, the back-bone arched like that of the ſquirrel, the body much thicker, and whiſkers like thoſe of a cat. It is not half a century ſince this ſpecies has been found in the neighbourhood of Paris. They multiply indeed prodigiouſly, for they generally produce twelve or fifteen, often ſixteen, ſeventeen, eighteen, and even nineteen young ones at a time. The males are larger, ſtronger, and more miſchievous than the females. When any one purſues, and endeavours to take them, they will turn again, and bite the hand or ſtick which touches them. Their bite is not only ſharp but dangerous, and is immediately followed by a conſiderable ſwelling. They bring forth thrice every year, the dams previouſly preparing a bed for their young; and thus two individuals of this ſpecies produce at leaſt three dozen in the ſpace of twelve months.

The brown rat in its nature, and ſome of its habitudes, bears a reſemblance to the water-rat. Though there is no place but in which they will reſide, they ſeem to delight in living near the water. When they find themſelves purſued, and have the ſame opportunity of ſheltering themſelves in the water, or in a thorny thicket, they prefer the former, plunge into it without dread, and ſwim with amazing dexterity. This particularly happens when they cannot get back to their burrows; for they always dig holes for themſelves in the earth, or elſe occupy thoſe of the rabbit. They may alſo be taken, like that animal, by the ferret, which follows them under ground as it does the rabbit, and even with more ardour.

Theſe animals live principally upon fruit and corn, but are, notwithſtanding, exceedingly carnivorous. They devour young rabbits, partridges, and other birds; and when they enter a hen-rooſt, they deſtroy, like the pole-cat, more than they eat. They do not become torpid in the winter, like the dormouſe, but take advantage of every fine day to come out of their ſubterranean manſions. Thoſe which live in barns, drive away the mice; and it has even been remarked, that the black rats, as they are called, have been far leſs common ſince the brown rats became ſo numerous.

The Marmot.

The Marmot, when taken young, is more capable of being tamed than any other wild animal, and nearly as much ſo as our domeſtic ones. It will eaſily learn to perform feats with a ſtick, to dance, and to obey the voice of its maſter. It bears a great antipathy at the dog; and when it becomes familiar in a houſe, and is certain of being ſupported by its maſter, it will, in his preſence, attack the largeſt dogs, and boldly faſten upon them with its teeth. Though this creature is not quite ſo large as a hare, it is of a more ſquat make, and has great ſtrength joined to great agility. It has four teeth in the front of the jaw, which are long and ſtrong enough to inflict a terrible wound; and yet, unleſs provoked to it, it neither attacks dogs, nor does miſchief to any other creature. If care be not taken, however, it will gnaw the furniture of an houſe, and will even make holes through wooden partitions.

As the marmot has very ſhort thighs, and the toes of its paws are formed much like thoſe of the bear, ſo it often ſits erect, and walks with eaſe, like that animal, upon its hind feet. With its fore-paws it carries its food to its mouth, and eats in an upright poſture like the ſquirrel. It runs much ſwifter up hill than down; it climbs trees, and runs up the clefts of rocks, or the contiguous walls of houſes, with great eaſe. Indeed, it is ludicrouſly obſerved of the Savoyards, who are the general chimney-ſweepers of Paris, that they have learned their trade from the marmot.

Theſe animals eat whatever is given them, whether it be fleſh, bread, fruits, herbs, roots, pulſe, or inſects. Of milk and butter, however, they are particularly fond; and though leſs inclined to petty thefts than the cat, they are never better pleaſed than when they obtain acceſs to the dairy.

There ſeems to be a combination of the bear and the rat in the form of the marmot. Its noſe, its lips, and the form of its head, are like thoſe of the hare; it has the hair and claws of the badger, the teeth of the beaver, the whiſkers of the cat, the paws of the bear, with a tufted tail and ſhort ears. The colour of its hair on the back is reddiſh brown. On the belly it is reddiſh, but ſofter and ſhorter. Its voice reſembles that of a little dog, when it is careſſed; but when it is irritated or frightened, it raiſes a loud and ſhrill cry, highly offenſive to the ear. The marmot is a very cleanly animal. In autumn particularly it is loaded with fat, though all the parts of the body are never equally ſo. The marmot, would be tolerable food, had it not an offenſive ſmell.

This animal, which delights in the regions of ice and ſnow, and is never found but on the higheſt mountains, is, nevertheleſs, moſt liable to be benumbed by the cold. From the end of September, or the beginning of October, the marmot generally retires to its hole, and does not return till about the beginning of April. The place of its retreat is formed with precaution, and furniſhed with art. It is rather wide than long, and very deep, ſo that it is capable of containing ſeveral, without being under a neceſſity of crowding each other, or injuring the air they breathe. Their feet and claws are formed as they were deſigned to dig; and, in fact, they burrow into the ground with amazing celerity, ſcraping up the earth, and throwing back what they have looſened behind them conſtantly as they proceed. Still more wonderful is the form of their hole; it reſembles the letter Y, the two branches having each an opening that conducts into one channel, which terminates in their apartment at the bottom. As the whole is contrived on the declivity of a mountain, there is no part of it on a level but the apartment at the end. One of the branches, or openings, iſſues out ſloping downward; and this ſerves as a kind of ſink, or drain, for the whole family, in which they void their excrements, and through which the moiſture of the place finds an eaſy paſſage. The other branch, on the contrary, ſlopes upward, and ſerves them for a door. The apartment at the end is warmly lined with moſs and hay. It is even aſſerted, that this work is carried on by the whole company; that ſome cut the fineſt graſs, others pile it up, and others take their turns to convey it to the hole. Upon this occaſion, it is added, one of them lies upon its back, permits the hay to be heaped upon its belly, keeps its paws upright to make greater room, and in this manner, remaining ſtill upon its back, is dragged by the tail, hay and all, to their common retreat. This practice ſome aſſign as a reaſon for the hair being generally worn away from their backs. However another, and perhaps a better reaſon can be given for this appearance; namely, their inhabiting cells under ground, and being conſtantly employed in digging up the earth. Whenever they venture abroad, one is placed as a centinel, ſitting on an elevated rock, while the others amuſe themſelves in the fields below, or are employed in cutting graſs, and making it into hay for their future convenience. And no ſooner does their centinel perceive a man, an eagle, a dog, or any other enemy, than he informs the reſt by a kind of whiſtle, and is himſelf the laſt that takes refuge in the cell.

They make no proviſion for the winter. But when they perceive the firſt approaches of the ſeaſon in which their vital motions are to continue in ſome meaſure ſuſpended, they labour very diligently to cloſe up the apertures of their dwellings, which they effect with ſuch ſolidity, that it is more eaſy to open the earth in any other part than where they have cloſed it. They are at that time very fat, and ſome of them are found to weigh twenty pounds. In this plight they continue for three months longer; but by degrees their fleſh begins to waſte, and they are quite thin by the end of winter. When their retreat is diſcovered, they are found each rolled into a ball, and covered with hay. In this ſtate they ſeem entirely lifeleſs. They may be taken away, and even killed, without betraying any ſymptom of pain:

and thoſe who find them in this manner, carry home the fat ones for food, and the young ones in order to rear and tame them. The marmot produces but once a year, and the litter generally conſiſts of three or four. The growth is quick, and they live only nine or ten years. They are found in the Alps, Appenines, Pyrenees, in the higheſt mountains of Germany, in Poland, and in Canada, with a few variations.

CHAP. XIII.

OF CARNIVOROUS ANIMALS CONTINUED—THE BEAR—THE BEAVER—THE RACOON—THE COATI—THE AGOUTI.

The Bear.

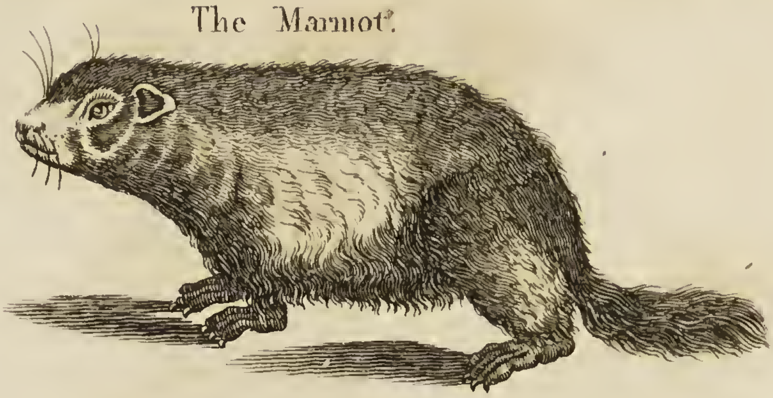
THERE is no animal more generally known than the bear, and yet there is none about which the writers of natural hiſtory are leſs agreed. Theſe uncertainties have ariſen from their not diſtinguiſhing properly the different ſpecies. The land-bear muſt be diſtinguiſhed from the ſea-bear, which is commonly known by the name of the white, or Greenland bear. The land bears muſt again be divided into two claſſes, the brown, and the black. There are ſome white land-bears found in Tartary, Ruſſia, &c. which, though they reſemble the ſea-bear in colour, differ from it, however, in every other particular. It is not the rigour of the climate that makes them white in winter, like the hares and ermines; they are brought forth white, and always remain ſo. There are alſo bears whoſe ſkins are a mixture of brown and black, which denotes an intermediate ſpecies between the white land-bear, and the brown or black bear.

We meet with the brown bear very frequently, and with the black bear very rarely, on the Alps. In the foreſts of the northern countries of Europe and America, on the contrary, the black bear is very common. The former is both fierce and carnivorous; the latter is only fierce, and conſtantly refuſes to eat fleſh.

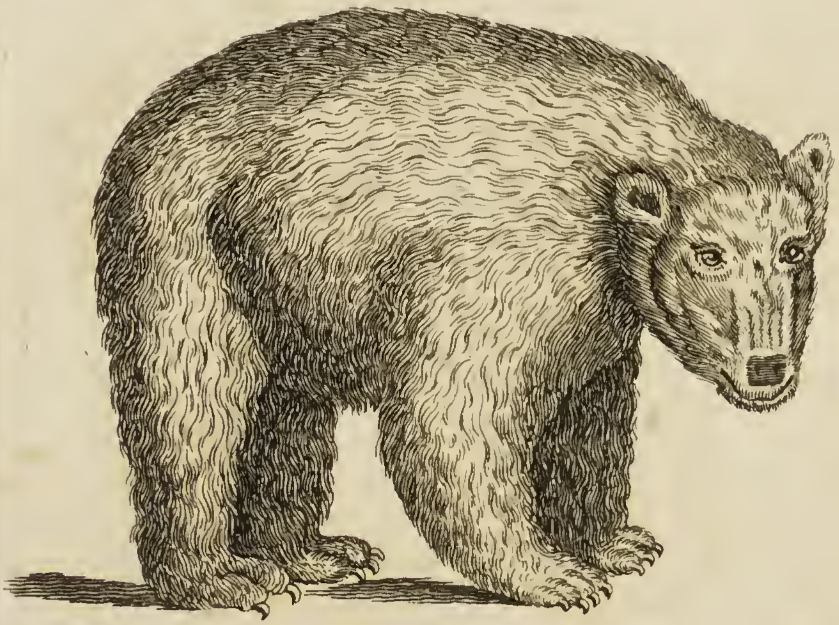
The bear is not only a ſavage, but a ſolitary animal; he takes refuge in the moſt unfrequented parts, and the moſt dangerous precipieces of uninhabited mountains. He makes his den in the moſt gloomy parts of the foreſt, in ſome cavern that has been hollowed by time, or in the hollow of ſome old enormous tree. Thither he retires alone, and paſſes a part of the winter without proviſions, or without ever ſtirring abroad. He is not, however, entirely deprived of ſenſation, like the dormouſe, or the marmot, but ſeems rather to ſubſiſt upon the exuberance of his former fleſh, and only feels the calls of appetite, when the fat he had acquired in ſummer begins to be entirely waſted.

When this happens, which, we are told, it generally does after forty or fifty days, the male forſakes his den; but the female remains confined for four months, till ſhe has brought forth her young. That the latter ſhould not only be able to ſubſiſt but even to nurſe their offſpring, without taking any food during that time, is, I think, highly improbable. When with young, however, it is allowed that they are exceedingly fat, as alſo, that, being covered with a very thick coat, ſleeping the greateſt

The Marmot.



The White Bear.



The Brown Bear.

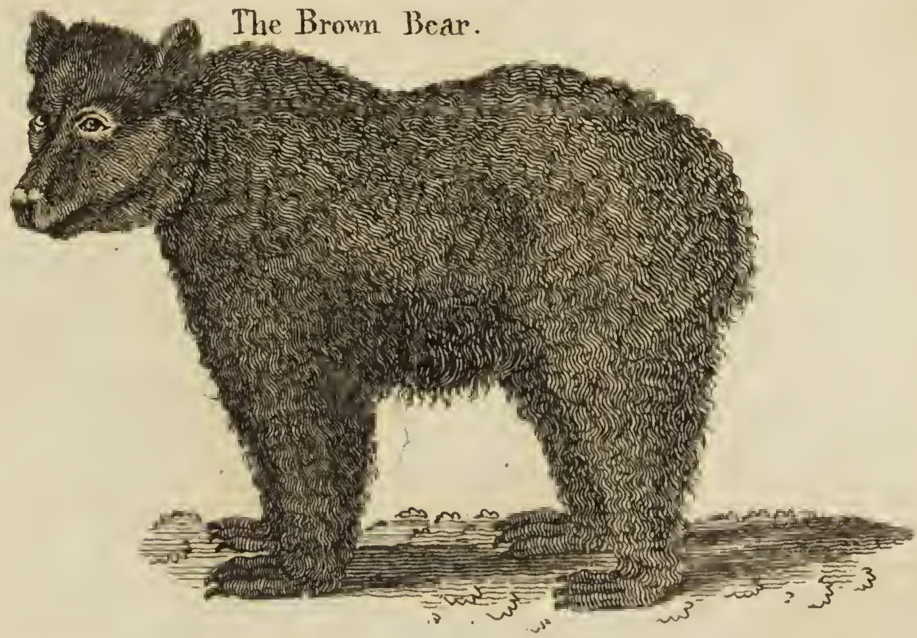


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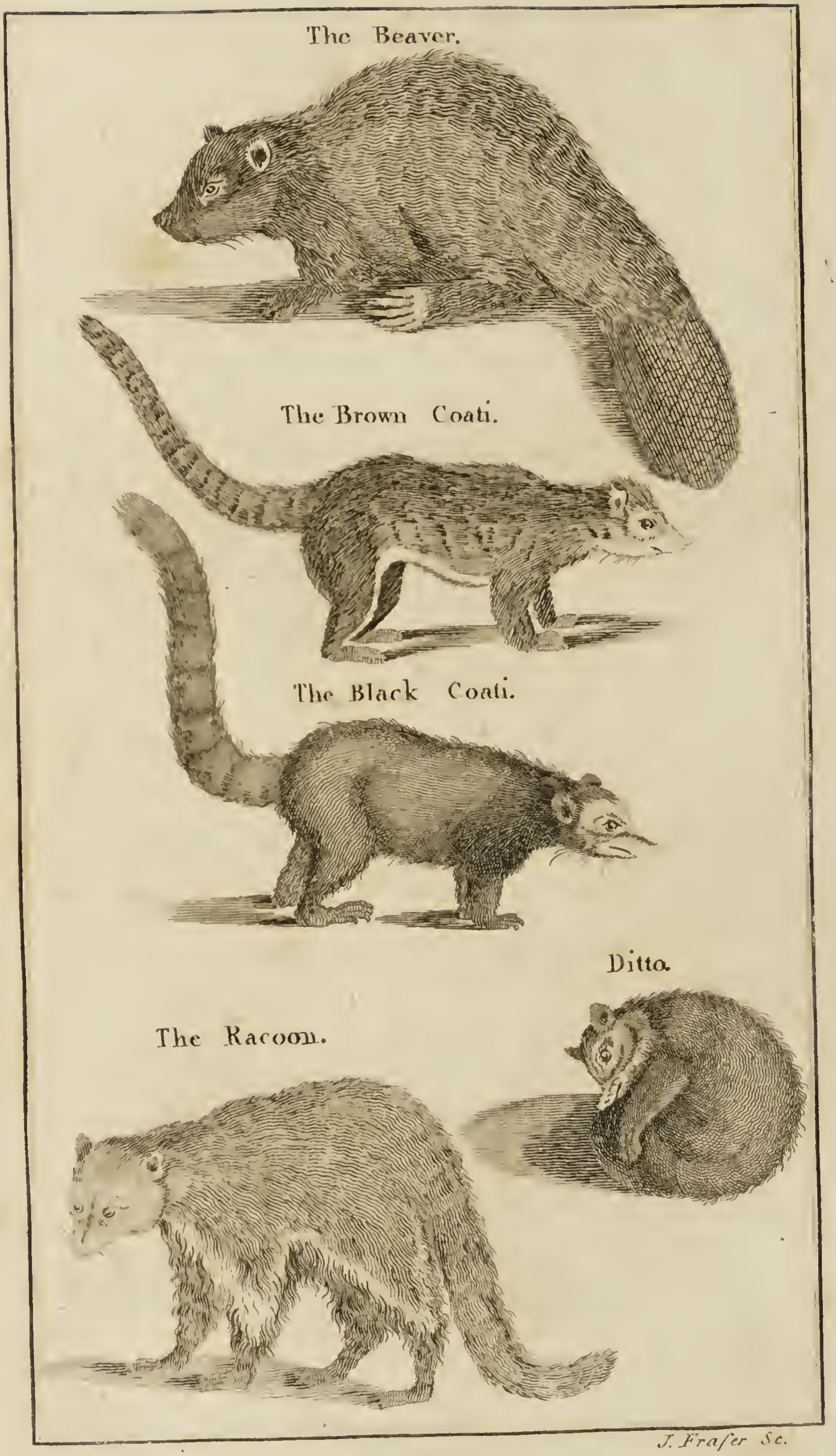
Plate 6.



The Beaver.

The Brown Coati.

The Black Coati.

Ditto.

The Racoon.

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eſt part of their time, and taking no exerciſe or motion, they muſt neceſſarily loſe very little by perſpiration.

Though the males of the brown ſpecies devour their young, when they find an opportunity for it, yet the females ſeem, on the contrary, to love them with a ferocious diſtraction. When once they have brought forth, their fury is more violent, as well as more dangerous, than that of the males. Before the young leave the womb, their formation is perfect; and if either the fœtus of the bear, or the bear when newly yeaned, appears, at the firſt glance, unformed, it is merely becauſe there is a want of proportion in the body and members even of the grown bear, and becauſe, which is well known to be the caſe in all animals, the fœtus, or the new produced animal, is always more diſproportioned than the grown one.

The voice of the bear is a kind of growl, a harſh murmur, which, when enraged, is heightened by a claſhing of the teeth. Highly ſuſceptible of anger, that anger is always furious, and often capricious. However mild he may appear before his maſter, and even obedient when tamed, he ought ſtill to be diſtruſted, ſtill treated with circumſpection. It is moſt dangerous to ſtrike him on the tip of the noſe, or to touch him on the parts of generation.

He is capable of ſome degree of inſtruction. There are few who have not ſeen him ſtand on his hind legs, or dance in rude and awkward meaſure, to tunes either ſung or played on an inſtrument. But, even in thus tutoring him, it is neceſſary, in order to ſucced, that he ſhould be taken young, and held in conſtraint ever after. The bear which has paſſed his youth, is not to be tamed nor even held in awe, and ſhews himſelf, if not intrepid, at leaſt fearleſs of danger.

The wild bear turns not from his path, nor offers to ſhun the ſight of man. It is ſaid, however, by a certain whiſtle he may be ſo far charmed as to ſtop, and ſtand upon his hind feet. This is the time to ſhoot him; for, when only wounded in an attack, he darts with fury at his foe, and, claſping him with his fore paws, is ſure to ſtifle him, unleſs immediate aſſiſtance be given.

The bear enjoys the ſenſes of ſeeing, hearing, and feeling, in great perfection; and yet, compared with the ſize of his body, his eye is very ſmall. His ears are alſo ſhort, his ſkin is coarſe, and his hair very thick. his ſmell is exquiſite; more ſo, perhaps, than that of any other animal, the internal ſurface of his noſe being very extenſive, and excellently calculated to receive the impreſſion of ſmells. He ſtrikes with his paws as a man ſtrikes with his fiſts; but in whatever he may bear a rude kind of reſemblance to the human ſpecies, he does not gain by this the leaſt aſcendancy over other animals.

The Beaver.

In all countries, as man is civilized and improved, the lower the ranks of animals are depreſſed and degraded. Either reduced to ſervitude, or treated as rebels, all their ſocieties are diſſolved, and all their united talents rendered ineffectual. Their feeble arts quickly diſappear; and nothing remains but their ſolitary inſtincts, or thoſe foreign habitudes which they receive from human education.

The beaver ſeems to be now the only remaining monument of that kind of intelligence in brutes, which, though infinitely inferior, as to its principle, to that of man, ſuppoſes, however, certain common projects,

jects, has certain relative ends in view. Projects which, having ſociety for their baſis, ſuppoſe ſome particular method of underſtanding one another, and of acting in concert.

It is allowed, that the beaver, far from having an abſolute ſuperiority over the other animals, ſeems, on the contrary, to be inferior to ſome of them. This fact I have an opportunity to confirm, having, for near a twelvemonth paſt, had a young beaver in my poſſeſſion, which was ſent to me from Canada in the beginning of the year 1758. It is an animal tolerably mild, tranquil and familiar, though rather, it would ſeem, gloomy and melancholy. If we conſider this animal, therefore, in its diſperſed and ſolitary ſtate, we ſhall find, that, as to internal qualities, it is not ſuperior to other animals. It has not more ingenuity than the dog, more ſenſe than the elephant, or more cunning than the fox. It is rather remarkable for the ſingularities of its external conformation than for any apparent ſuperiority of its internal qualities. Of quadrupeds, the beaver alone has a flat oval tail, covered with ſcales, which ſerves as a rudder to direct its motions in the water. It is the only quadruped that has membranes between the toes on the hind feet, and at the ſame time none on the fore ones, with which it conveys its food to its mouth. It is the only one which, while it reſembles a terreſtrial animal in its fore parts, ſeems to approach the nature of an aquatic being in its hind ones.

The beavers begin in the month of June or July, to form a ſociety, which is to continue for the greateſt part of the year. They arrive in numbers from every ſide, and preſently form a company of two or three hundred. The place of meeting is commonly the place where they fix their abode, which is always by the ſide of ſome lake or river. If it be a lake in which the waters are always upon a level, they do not build a dam; but if it be a running ſtream, they build a dam, or pier, a-croſs the river. This dam, or pier, is often four-ſcore or an hundred feet long, and ten or twelve feet thick at the baſe. If we compare the greatneſs of the work with the powers of the architect*, it will appear enormous; but the ſolidity with which it is built, is ſtill more aſtoniſhing than its ſize. The part of the river over which this dam is uſually built, is where it is moſt ſhallow, and where ſome great tree is found growing by the ſide of the ſtream. This they make choice of for the principal part in their building; and, though it is often thicker than a man's body, they ſoon cut it down. For this operation they have no other inſtrument than their four inciſive teeth, with which they make it fall always acroſs the ſtream. They then ſet about cutting the top branches, to make it lie cloſe and even, and ſerve as the principal beam for their fabric.

Theſe operations are performed in common. At one time a number of beavers are employed together at the foot of the tree in gnawing it down; and, when this part of their labour is finiſhed, it becomes the buſineſs of others to ſeparate the branches, while a third party are engaged along the banks of the river, or lake, in cutting other trees, which, though ſmaller than the firſt, are yet as thick as the leg, if not the thigh, of a common-ſized man. Theſe they carry with them by land to the brink of the river, and then by water to the place allotted for their building; where, ſharpening them at one end, and forming them into ſtakes, they drive them into the ground, at a ſmall diſtance from each other, and fill up the vacant ſpaces with pliant branches. While ſome are thus employed in faſtening the ſtakes, others go in ſearch of clay, which they prepare for their purpoſe with their tails and their feet, and with which, they render their ſtructure ſtill more compact.

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* The largeſt beavers weigh from fifty to ſixty pounds, and, in length, are little more than three feet from the tip of the ſnout to the inſertion of the tail.

This ſtructure is ſo ingeniouſly contrived, that it has not only all the extent, and all the ſolidity, which are requiſite, but alſo a form the moſt proper for confining the water, and, when it has paſſed its bounds, for maintaining its weight, or baffling its attack. At the top of their dike or mole, where it is leaſt thick, they form two or three openings. Theſe they occaſionally enlarge or contract, as the river occaſionlly riſes or falls; and when, from inundations or torrents, their works have been damaged, they immediately repair them with the utmoſt care.

After this diſplay of their labours to accompliſh a public work, it would be ſuperfluous to add to it a deſcription of their private conſtructions, were it not that, in hiſtory, an account ſhould be given of every fact, and that, in this firſt grand work of the beaver, the intention uniformly was, that the little habitation of each family ſhould be rendered more commodious.

This habitation is always furniſhed with two paſſages; one for the purpoſe of a land, and the other for that of a water excurſion. In ſhape it is almoſt always either oval or round; ſometimes it is from four to five feet in diameter, and ſometimes it conſiſts of two, and even three ſtories, while the walls are always two feet thick. When it happens to conſiſt of but one ſtory, the walls are but a few feet high, there is a kind of vault over them, that ſerves as a covering for the edifice. It is conſtructed with ſuch ſolidity as to be impenetrable to the heavieſt rains, to defy the moſt impetuous winds, and is plaiſtered with ſuch neatneſs, both without and within, that it might naturally be thought an effort of human ſkill. Theſe animals, nevertheleſs, uſe no inſtrument for the preparation of their mortar, but their feet, or for the application of it, but their tails. They make the greateſt uſe of ſuch materials as are not eaſily diſſolved by water. Their wooden work conſiſts of ſuch trees as grow on the banks of rivers, as theſe are moſt eaſily cut down, ſtripped of their bark, and carried; and all theſe operations they perform before they relinquiſh a tree which they have once attacked. They cut it at the diſtance of a foot or a foot and a half from the ground. They ſit as they work; and, beſides the advantage of this convenient poſture, they have the pleaſure of continually gnawing freſh bark and ſoft wood, both which they prefer to moſt other kinds of aliment. Averſe to dry wood, they always provide an ample ſtore of theſe for their ſubſiſtence during winter*. Near their habitations they eſtabliſh their magazines; and to each hut or cabin there is one allotted, of a ſize proportioned to the number of its inhabitants, to which they have all a common right; nor do they attempt to plunder their neighbours.

Hamlets, to uſe the expreſſion, have been ſeen, compoſed of twenty and even twenty-five dwellings. Such large ſettlements, however, are rare. In general, they do not contain more than ten or a dozen families, each of which has its own ſeparate diſtrict, magazine, and habitation; nor will it allow any ſtrangers to ſettle within its incloſure. The ſmalleſt dwellings contain two, four, and ſix; the largeſt, eighteen, twenty, and even thirty beavers; and it ſeldom or never happens, that the number of males and females is not pretty equal. Their ſociety therefore may be ſaid to conſiſt frequently of one hundred and fifty or two hundred workmen, who, having firſt exerted their united induſtry and deligence in rearing a grand public work, afterwards form themſelves into different bodies, in order to conſtruct private habitations.

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* The ſpace allotted for the proviſion of eight or ten beavers, occupies from twenty-five to thirty feet ſquare, and from eight to ten feet deep.

However numerous the republic of beavers may be, peace and good order are uniformly maintained in it. A common ſeries of toil has cemented their union. The conveniencies which they have procured for each other, and the abundance of proviſions which after having amaſſed, they continue to conſume together, render them happy within themſelves. Having moderate appetites, entertaining even an averſion to blood and carnage, they have not the ſmalleſt propenſity to hoſtility or rapine, but actually enjoy all the bleſſings which man is only born to deſire. Friends to each other, if threatened by any enemies from abroad, they know how to avoid them; and for this purpoſe, on the firſt alarm, they give notice of their mutual danger, by ſtriking the water with their tail, which emits a ſound that is heard in their moſt diſtant dwellings. On this occaſion, each beaver, as he thinks moſt expedient, plunges into the water, or conceals himſelf within the walls of his own habitation, which is in no danger but from the fire of the heavens, or from the weapons of man.

Theſe aſylums are not only ſecure, but alſo very neat and commodious. The floor is covered with verdure. Young and tender branches of trees ſerve them for a carpet, on which they never permit any of their excrements to be left. The window which fronts the water ſerves them for a balcony, from which they enjoy the freſh air, and bathe themſelves the greateſt part of the day. In the water they remain in an upright poſture, the head and fore parts only being viſible. This element is, indeed, ſo neceſſary to them, or rather gives them ſo much pleaſure, that they ſeem unable, as it were, to live without frequent immerſions in it. Sometimes they go to a conſiderable diſtance under the ice; and then it is eaſy to take them if we attack the dwelling and wait for them, at the ſame time, at a hole which is purpoſely formed a little way off in the ice, and to which they are obliged to come for breath.

The habit which this animal has, of continually keeping the tail, and all the hind parts of the body in the water, ſeems to have changed the nature of its fleſh. That of the fore parts, till we come to the reins, is of the ſame quality, taſte, and conſiſtency, as the fleſh of land-animals; and of the tail, and of the hind legs and thighs, has the ſmell, the ſavour, and all the qualities of fiſh. As for the tail in particular, it is an extremity of a fiſh fixed to the body of a quadruped. In length it generally meaſures a foot, in thickneſs an inch, and in breadth five or ſix inches. It is entirely covered over with ſcales, and has a ſkin perfectly the ſame as that of a large fiſh.

The females are ſaid to go four months with young. They bring forth about the cloſe of winter, and their number generally conſiſts of two or three at a time. About this period the males leave them, and go forth into the fields, where they enjoy all the ſweets of the ſpring. In this ſeaſon they pay occaſional viſits to their habitation, but never reſide in it. There, however, the females remain employed in ſuckling, tending, and rearing up their young, who can follow them in a few weeks. They then, in their turn, go abroad, where they feed on fiſh, or on the bark of young trees, and ſpend their whole time in the water, or the woods.

Winter is the principal ſeaſon for hunting them, as it is then only that their fur is in perfection. After their fabrics are demoliſhed, and a great number happen to be taken, their ſociety is never reſtored. The few that have eſcaped captivity or death, become houſeleſs wanderers; or, concealed in ſome hole under ground, and reduced to the condition of other animals, they lead a timed life. They no longer employ themſelves but to ſatisfy their immediate and moſt urgent wants. They no longer retain thoſe faculties and qualities which they ſo eminently poſſeſs in a ſtate of ſociety.

We meet with beavers in America from the thirtieth degree of north latitude to the ſixtieth, and even beyond it. In the northern parts they are very common; and the farther ſouth we proceed, their number is ſtill found to decreaſe. The ſame obſervation holds with reſpect to the Old Continent. We never find them numerous but in the more northern countries; and in France, Spain, Italy, Greece, and Egypt, they are exceedingly rare. They were no ſtrangers to the ancients; and by the religion of the Magi it was forbidden to kill them.

Several authors have ſaid, that the beaver, being an aquatic animal, could not live ſolely on land. This opinion, however, is erroneous; for the beaver which I have in my poſſeſſion having been taken when quite young in Canada, and been always reared in the houſe, did not know the water when he was brought to it, was afraid of it, and refuſed to go into it. Even when firſt plunged into a baſon there was a neceſſity for keeping him in it by force. A few minutes after, however, he became ſo well reconciled to it, that he no longer diſcovered an averſion to his new ſituation; and, when afterwards left to his liberty, he frequently returned to it, and would even roll about in the dirt, and upon the wet pavement. One day he made his eſcape, and deſcended by a cellar ſtair caſe into the quarries under the Royal Garden. There he ſwam to a conſiderable diſtance on the ſtagnated waters which are at the bottom of thoſe quarries; yet no ſooner did he ſee the light of the torches which were ordered down for the purpoſe of finding him, than he returned, and allowed himſelf to be taken without the ſmalleſt reſiſtance.

He is familiar without being fawning; and when he ſees people at table, he is ſure to aſk ſomething to eat. This he does by a little plaintive cry, and by a few geſtures of his fore paws. When he has obtained a morſel, he carries it away, and conceals himſelf, in order to eat it at his eaſe. When he ſleeps, which he does very often, he lies upon his belly. No food comes amiſs to him, meat excepted; and this he conſtantly refuſes either raw or boiled. He gnaws every thing he comes near; and it was found neceſſary to line with tin the tun in which he was brought over.

Beſides the fur, which is indeed the moſt valuable article furniſhed by the beaver, this animal furniſhes a ſubſtance that has been conſiderably uſed in medicine. This ſubſtance, which is known by the name of *caſtoreum*, is contained in two bladders*. The ſavages are ſaid to obtain an oil from the tail of the beaver, which they employ as a topical remedy for different complaints. The fleſh of this animal, though fat and delicate, is yet bitter, and diſagreeable to the palate.

The ſenſes of the beaver are very acute; and ſo delicate is its ſmell, that it will ſuffer no filth to remain near it. When kept too long in confinement, and under a neceſſity of voiding its excrements, it drops them near the threſhold of its priſon, and, when the door is opened, it is ſure to puſh them out.

The Racoon.

The Raccon is an animal of about the ſame ſize as a ſmall badger. Its body is ſhort and bulky. Its fur is fine, long, thick, blackiſh at the ſurface, and grey towards the bottom. Its head is like that of the fox, but its ears are round and ſhorter. Its eyes are large, of a yellowiſh green, and over them there is a black and tranſverſe ſtripe. Its ſnout is ſharp. Its tail is thick, but tapering towards a point, and marked alternately from one end to the other with black and white rings, and is at leaſt as long as the body. Its fore legs are much ſhorter than the hind ones, and both are armed with five ſtrong, ſharp claws.

This animal uſes its paws to hold its food while eating; and its pointed claws enable it to climb trees with great dexterity. It runs up the trunk with the ſame ſwiftneſs that it moves over the plain, and frolics about to the extremity of the branches with great ſecurity and eaſe; on the ground, indeed, it rather bounds than runs, and its motions, though oblique, are yet always quick and expeditious.

The racoon is a native of the ſouthern countries of America and the Weſt-Indies, nor has it ever yet been found in any part of the Old Continent.

The Coati.

The animal of which we are now about to treat, many authors have called *coati-mondi*. It is very different from the animal deſcribed in the preceding article. It is of a ſmaller ſize than the racoon. Its body and neck, its head and noſe are of a more lengthened form. Its upper jaw is an inch, or an inch and a half longer than the lower one; and its ſnout, which is moveable in every diviſion, turns up at the point. The eyes of the coati are alſo ſmaller than the eyes of the racoon. Its hair is longer and coarſer, its legs are ſhorter, and its feet longer; but, like the racoon, its tail is deverſified with rings; and to all its feet there are five claws.

This animal has a practice of eating its own tail, which, when not mutilated, is longer than its body, and which it generally raiſes aloft, and can move with eaſe in any direction.

From this circumſtance we may infer that in thoſe parts of which the extremities are conſequently very remote from the ſeat of the ſenſes, that feeling muſt be weak, and the more ſo, the greater the diſtance, and the ſmaller the part.

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* It is pretended, that the beavers extract the liquid which is contained in theſe bladders by preſſing them with the foot; and that it gives them an appetite when they are averſe to food. The truth, however, ſeems to be, that the animal uſes this liquid, in order to greaſe its tail.

As for the coati in other reſpects, it is an animal of prey, which ſubſiſts on fleſh and blood, which, like the fox, deſtroys ſmall animals and poultry, hunts for the neſts of little birds, and devours their eggs; and it is probably from this conformity of diſpoſition, that ſome authors have conſidered the coati as a ſpecies of ſmall fox.

The Agouti.

This animal is about the ſize of a hare, and has been improperly conſidered as a kind of rabbit, or large rat, by the greater number of of nomenclators. It has both the hair of an hog, and the voracious appetite of that animal. It eats every thing indiſcriminately; and when ſatiated, it hides the remainder, like the dog or the fox, for a future occaſion.

It does not, like the rabbit, dig a hole in the ground, but burrows in the holes of trees. Its ordinary food conſiſts of the roots of the country, potatoes, yams, and ſuch fruits as fall from the trees in autumn. It uſes its fore-paws like the ſquirrel, to carry its food to its mouth; and as its hind feet are longer than the fore-ones, it runs very ſwiftly upon level ground, or up a hill, but upon a declivity it is in danger of falling. Its ſight is excellent; its hearing is equal to that of any other animal; and whenever it is whiſtled to, it ſtops to liſten. The fleſh is dreſſed like that of a ſucking pig, and of ſuch as are well fed, it is tolerable food, though it has always a peculiar taſte, and is rather tough.

It is hunted by dogs; and whenever it goes into a ſugar ground, where the canes cover the place, it is eaſily catched. When in the open country, it uſually runs with great ſwiftneſs before the dogs until it gains its retreat, within which it continues to hide, and nothing but filling the hole with ſmoke can force it out. For this purpoſe the huntſman burns faggots or ſtraw at the entrance, and conducts the ſmoke in ſuch a manner that it fills the whole cavity. While this is doing, the poor little animal ſeems ſenſible of its danger, begs for quarter with a moſt plaintive cry, but ſeldom quits its hole till the utmoſt extremity.

The agouti ſeems to be a native of the ſouth parts of America; nor is it at all known in the Old Continent. It is, however, very common in Braſil, Guiana, St Domingo, and all the neighbouring iſlands. To the cold and temperate climates of America this animal is an entire ſtranger.

CHAP. XIV.

OF CARNIVOROUS ANIMALS CONTINUED—THE LION—THE TIGER—THE PANTHER, OUNCE, AND LEOPARD—THE JAGUAR—THE COUGUAR.—THE LYNX—THE CARACAL—THE HYÆNA—THE CIVET AND ZIBET—THE GENETT—THE ONDATRA AND DESMAN.

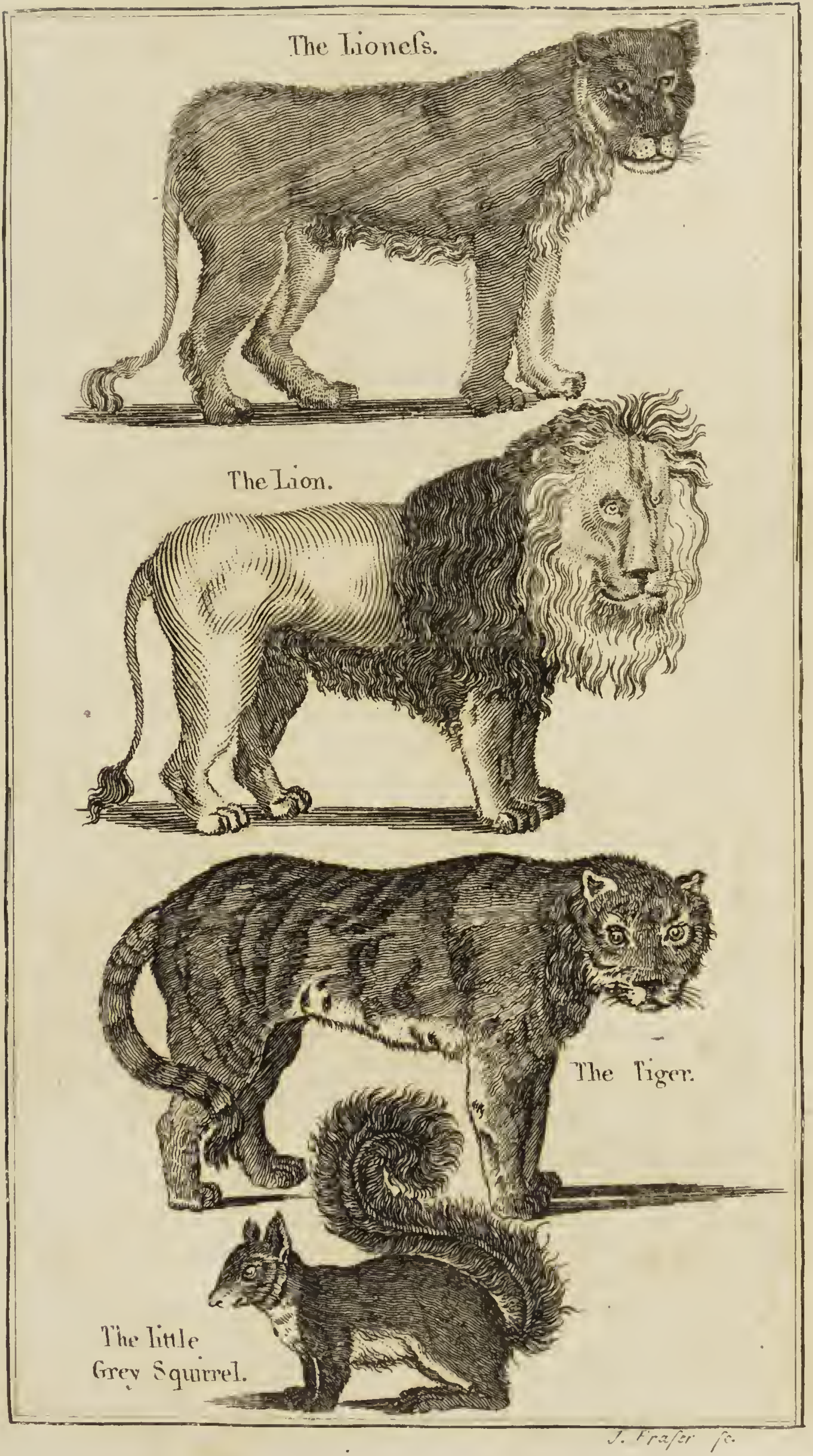
The Lion.

IT has been remarked that in all hot climates, the terreſtrial animals are larger and ſtronger than in cold or temperate ones. They are alſo bolder and more ferocious, all their natural qualities ſeeming to partake of the ardour of the climates in which they live. The lion, produced beneath the burning ſun of Africa, or of India, is above all others the fierceſt and moſt terrible. Our wolves, our other carnivorous animals, far from being his rivals, are hardly worthy to be his providers. The lions of America (if, indeed, they deſerve to be called lions) are, like the climate in which they are produced, infinitely milder than thoſe of Africa; and, what clearly proves that the degree of fierceneſs in this animal depends on the degree of heat, is, that, even in the ſame country, thoſe which inhabit the high mountains, where the air is more temperate, are different in diſpoſition from thoſe that dwell in the plains, where the heat is exceſſive.

As the lion has no enemy but man, and his ſpecies is now probably reduced to the fiftieth part of what it formerly was, it follows, that the human race, inſtead of having ſuffered a conſiderable diminution ſince the time of the Romans, is, on the contrary, more numerous, and more generally diffuſed. This ſuperiority in the numbers, and the arts of the human ſpecies, while it ſuffices to conquer the lion, ſerves alſo to enervate, and to diſcourage him; for he is brave only in proportion to the ſucceſs of his former encounters. Accuſtomed to meaſure his ſtrength with every animal he meets, the habit of conquering renders him intrepid and terrible. Having never experienced the dangerous arts and combinations of man, theſe animals have no apprehenſions from his power. They meet him with courage, and ſeem to brave the force of his arms. They are not daunted even with the oppoſition of numbers. A ſingle lion of the deſert, often attacks an entire caravan; and, after an obſtinate combat, when he finds himſelf overpowered, inſtead of flying, he continues to combat, retreating, but ſtill facing his enemy till he dies. On the contrary, the lions which inhabit the peopled countries of Morocco, or India, having experienced the ſuperiority of man, loſt all their courage, ſo as to be ſcared away with a ſhout; and ſeldom attack any but the unreſiſting flocks or herds, which even women and children are ſufficient to protect.

The external form of the lion ſeems to ſpeak the ſuperiority of his internal qualities. His figure is ſtriking, his look confident and bold, his gait proud, and his voice terrible. His ſtature is not over grown, like that of the elephant, or the rhinoceros; nor is his ſhape clumſey, like that of the hippopotamos, or the ox. He is in every reſpect compact and well-proportioned, a perfect model of ſtrength joined with agility.

Plate 8.


The Lioneſs.
The Lion.
The Tiger.
The little Grey Squirrel.

J. Fraſer ſc.

His force and muſcular power, he manifeſts by his prodigious leaps and bounds; by the ſtrong and quick agitation of his tail, which alone is ſufficient to throw a man on the ground. By the facility with which he moves the ſkin of his face, and particularly that of his forehead, which adds greatly to his phyſiognomy, or rather to the expreſſive fury of his countenance; and in ſhort, by ſhaking his mane, which is not only briſtled up, but moved and agitated on all ſides when he is enraged.

The largeſt lions are about eight or nine feet long, from the ſnoot to the root of the tail, which is of itſelf four feet long; and theſe large lions are about four or five feet high. Thoſe of the ſmall ſize, are about five feet and a half long, and three and a half high. In all her dimenſions, the lioneſs is about a fourth leſs than the lion.

The lion is furniſhed with a mane, which becomes longer in proportion as he grows older. The lioneſs, howver, is without this appendage at every age. The American animal, which the natives of Peru call *puma*, and to which the Europeans have given the denomination of *lion*, has no mane. It is alſo much ſmaller, weaker, and more cowardly, than the real lion. In truth, it is very doubtful whether theſe animals are of the ſame ſpecies.

Both the ancients and the moderns allow that the lion when newly produced, is not above ſix or ſeven inches long; and if ſo, ſome years at leaſt muſt elapſe before he can increaſe to eight or nine feet. They likewiſe mention, that he is not in a condition to walk till two months after he is brought forth; but, without giving entire credit to theſe aſſertions, we may fairly conclude, that the lion, from the largeneſs of his ſize, is at leaſt three or four years in growing, and that, conſequetnly, he muſt live ſeven times three or four years, that is, about twenty-five years.

It is uſually ſuppoſed that the lion does not poſſeſs the ſenſe of ſmelling in ſuch perfection as moſt other animals of prey. Too ſtrong a light incommodes him. He ſeldom goes abroad in the middle of the day. He commits all his ravages in the night. When he ſees a fire kindled near a herd or flock he will not venture near it. Though his ſight is bad, it is not, however, ſo faulty as his ſmell; and unlike the dog and the wolf, he rather hunts by the former than by the latter.

The lion, when hungry, boldly attacks all animals that come in his way; but, as he is very formidable, and as they all ſeek to avoid him, he is often obliged to ſkulk that he may take them by ſurpriſe. For this purpoſe he crouches upon his belly, in ſome thicket, or among the long graſs, which is found in many parts of the foreſt. In this retreat he continues, with patient expectation, until his prey comes within a proper diſtance; and he then ſprings after it with ſuch force, that he often ſeizes it at the firſt bound. If he miſſes the effort, and in two or three re-iterated ſprings cannot ſeize his prey, he continues motionleſs for a time, ſeems to be very ſenſible of his diſappointment, and waits for a more favourable opportunity. He devours a great deal at a time, and generally fills himſelf for two or three days to come. His teeth are ſo ſtrong that he very eaſily breaks the bones, and ſwallows them with the reſt of the body. It is reported that he can endure hunger a very long time; but he cannot ſupport thirſt in an equal degree, his temperament being extremely hot. He drinks as often as he meets with water, lapping like a dog. He generally requires about fifteen pounds of raw fleſh in a day; and ſeldom devours the bodies of animals when they begin to putrify. While young and active, the lion ſubſiſts on what he can obtain by the chace, and ſeldom quits his native deſerts and foreſts; but when he becomes old, heavy, and leſs qualified for exerciſe, he approaches the habitations of man, to whom he becomes a dangerous enemy. It is obſerved, however, that when he ſees men and animals together, it is always on the latter, never on the former, that he vents his fury; unleſs indeed he ſhould be ſtruck, and then, at no loſs to know whence the blow came, he inſtantly deſerts his prey, in order to be revenged for the injury. The fleſh of the camel he is ſaid to prefer to that of any other animal. He is likewiſe exceedingly fond of that of young elephants, which, from their inability to reſiſt him till they have received the aſſiſtance of their tuſks, he eaſily diſpatches, when unprotected by the dam; nor are there any animals able to oppoſe the lion, but the elephant, the rhinoceros, the tiger, and the hippopotamos.

However terrible this animal may be, it is not uncommon, with dogs of a large ſize, and well ſupported with a proper number of men on horſeback, to chace him, diſlodge him, and force him to retire. But for this enterprize it is neceſſary that the dogs, and even the horſes, ſhould be previouſly diſciplined; ſince almoſt all animals tremble and fly at the very ſmell of the lion. Though his ſkin is firm and compact, it is not, however, proof againſt a muſket-ball, or even a javelin. Like the wolf, he is frequently taken by ſtratagem; and for this purpoſe a deep hole is dug in the earth, over which, when ſlightly covered with earth and ſticks, ſome living animal is faſtened, as a bait. When thus entrapped, all his fury ſubſides; and if advantage be taken of the firſt moments of his ſurpriſe, he may be eaſily chained, muzzled, and carried off.

The fleſh of the lion is of a ſtrong and diſagreeable flavour; yet the Negroes and the Indians do not diſlike it, and it frequently forms a part of their food.

The Tiger.

In the claſs of carnivorous animals the lion is the foremoſt. Next to him is the tiger, which, while he poſſeſſes all the bad qualities of the former, ſeems to be a ſtranger to his good ones. To pride, to courage, to ſtrength, the lion adds greatneſs, and ſometimes, perhaps, clemency; while the tiger, without provocation is fierce, without neceſſity is cruel. Thus it is throughout all the claſſes of Nature, in which the ſuperiority of rank proceeds from that of ſtrength. The firſt claſs is leſs tyrrannical than the inferior claſſes, which, denied ſo full an exertion of authority, abuſe the powers with which they are entruſted.

The tiger is therefore more to be dreaded than the lion. He is the ſcourge of every country which he inhabits. Of the appearance of man, and of all his hoſtile weapons, he is fearleſs. Wild animals as well as tame ones fall a ſacrifice before him. He attacks the young elephant and rhinoceros; and ſometimes, with an audacity ſuperior to his nature, he braves the lion himſelf.

The form of the body uſually correſponds with the nature, and the diſpoſition of the animal. The tiger, with a body too long, with limbs too ſhort, with a head uncovered, and with eyes ghaſtly and haggard, has no characteriſtics but thoſe of the baſeſt and moſt inſatiable cruelty. Inſtead of inſtinct he has nothing but an uniform rage, a blind fury;

ſo blind indeed, ſo undiſtinguiſhing, that he frequently devours his own progeny, and, if ſhe offers to defend them, he tears in pieces the dam herſelf.

Happy is it for the reſt of nature, that this animal is but rare, and that the ſpecies is chiefly confined to the warmeſt provinces of the Eaſt. The tiger is found in Malabar, in Siam, in Bengal, and in all the countries which are inhabited by the elephant or the rhinoceros.

When he has killed a large animal, ſuch as a horſe, or a buffalo, he does not devour it on the ſpot, but in order to feaſt at his eaſe, he draggs it along with ſuch eaſe to the foreſt, that the ſwiftneſs of his motion ſeems ſcarcely retarded by the enormous weight.

To give a ſtill more complete idea of the ſtrength of this terrible creature, we ſhall quote a paſſage from Father Tachard, who was an eye-witneſs of a combat of one tiger againſt three elephants at Siam. For this purpoſe, the king ordered a lofty palliſade to be built of bamboo cane, about an hundred feet ſquare; and in the midſt of this were three elephants to combat the tiger. Their heads and part of their trunks were covered with a kind of armour, like a maſk, which defended that part from the aſſaults of the fierce animal with which they were to engage. As ſoon, ſays this author, as we were arrived at the place, the largeſt tiger we had ever ſeen was brought from his den. He was not at firſt let looſe, but held with cords, ſo that one of the elephants approaching, gave him three or four blows, with his trunk, on the back, with ſuch force, that the tiger was for ſome time ſtunned, and lay without motion, as if he had been dead. However, as ſoon as he was let looſe, and at full liberty, although the firſt blows had greatly abated his fury, he made at the elephant with a loud ſhriek, and aimed at ſeizing his trunk. But the elephant, wrinkling it up with great dexterity, received the tiger on his great teeth, and toſſed him up in the air. This ſo diſcouraged the furious animal, that he no more ventured to approach the elephant, but made ſeveral circuits round the palliſade, often attempting to fly at the ſpectators. Shortly after, a ſecond and then a third elephant were ſent againſt him, which ſtruck him ſo terribly with their trunks, that he once more appeared dead; and they would certainly have diſpatched him, had not a ſtop been put to the combat.

The tiger, of which Father Gouie has communicated to the Academy of Sciences an anatomical deſcription, compoſed by the Jeſuit Fathers at China, ſeems to belong to the true ſpecies, as alſo that which the Portugueſe have diſtinguiſhed by the name of *Royal Tiger*. According to Dellon there is no country of India in which tigers ſo much abound as Malabar, where the ſpecies are numerous, but the largeſt is that which the Portugueſe call the *Royal Tiger*, which is very rare, and is as large as a horſe.

The ſpecies of the tiger has always been much rarer, and much leſs generally diffuſed, than that of the lion. Like the lioneſs, nevertheleſs, the tigreſs produces four or five at a birth. From her nature ſhe is fierce at all times; but when ſurrounded with her infant progeny, and in the ſmalleſt danger of loſing them, her fury, becomes extravagant. To oppoſe the daring invaders of her den, ſhe braves every danger. On ſuch occaſions, ſhe purſues the ſpoiler with the moſt inveterate enmity; who is frequently obliged to drop one of her cubs. With this ſhe immediately returns to her den, and again purſues him:

he then drops another; and, by the time ſhe has returned with that, he for the moſt part eſcapes with the remainder. Should her young be torn from her entirely, ſhe expreſſes her agony with hideous cries, and follows the ſporter to the very town, or ſhip, in which he may have taken refuge, and dares him, to approach her.

The ſkins of theſe animals are much eſteemed in the eaſt, particularly in China. The Mandarines cover their ſeats of juſtice with them, and convert them into coverings for cuſhions in winter. The Indians eat the fleſh of the tiger, and find it neither diſagreeable nor unwholeſome.

The Panther, Ounce, and Leopard.

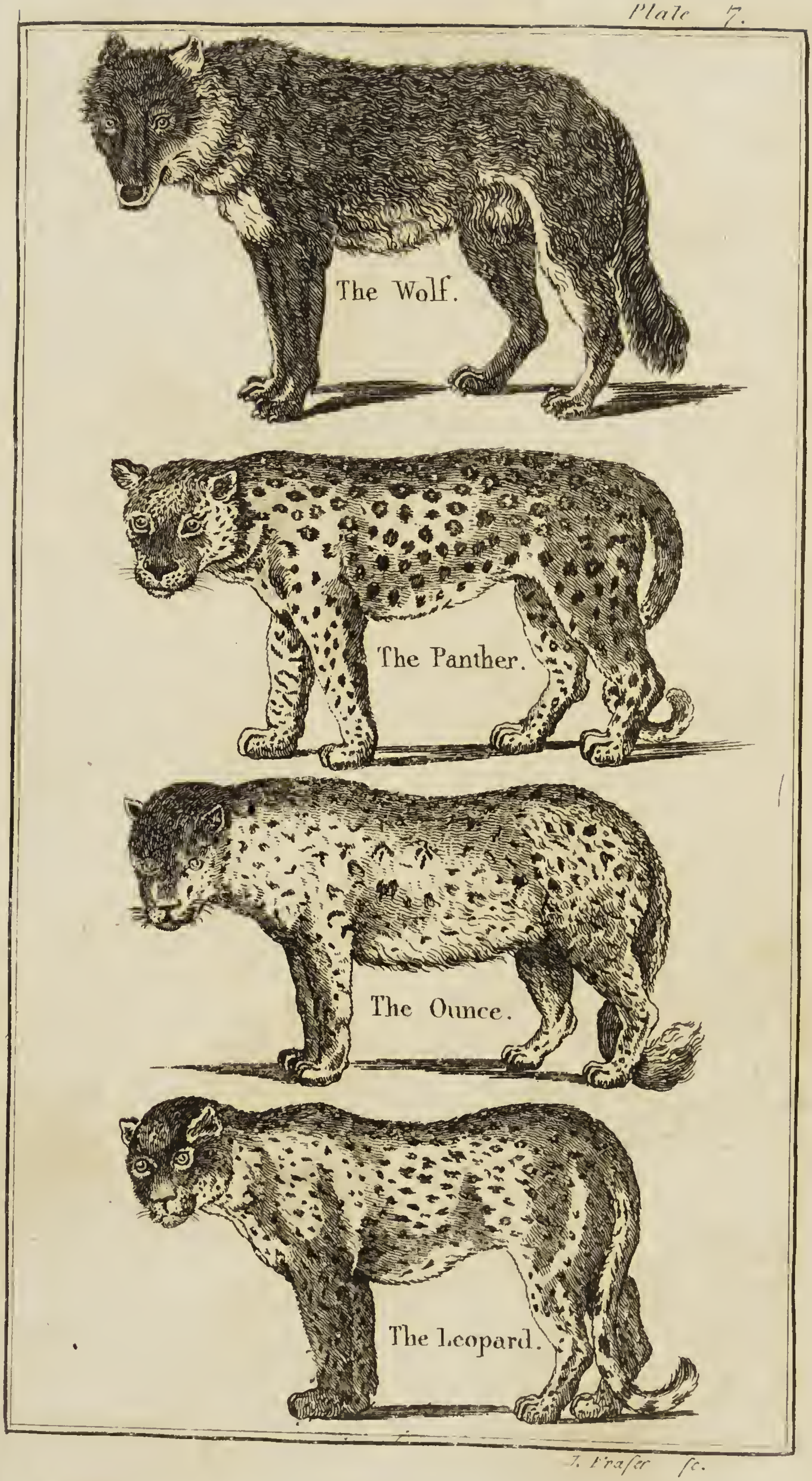
The firſt of theſe ſpecies which exiſts in the Old Continent is the *large panther*, which we ſhall ſimply call *panther*, and which the Greeks diſtinguiſhed by the name of *pardalis*, the ancient Latins, firſt by the name of *panthera*, afterwards by that of *pradus*, and the modern Latins by the name of *leopardus*. The body of this animal, when it has attained its full growth, is five or ſix feet long from the tip of the noſe to the inſertion of the tail, which is above two feet long. Its ſkin is of a yellow hue, more or leſs dark on the back and ſides, and whitiſh under the belly. It is marked with black ſpots in the form of beads. Of theſe rings the greateſt number have one or more ſpots in the center, of the ſame colour with the extremity of the ring. Some of them are oval, and others circular; and they are frequently above three inches in diameter.

The ſecond ſpecies is the *ſmall panther* of Oppian, which our modern travellers have called *ounce*, or *onza*, corruptedly from the name *lynx*, or *lunx*. To this animal we ſhall preſerve the name of *ounce*, which, as it has in fact ſome affinity to the lynx, ſeems to be properly applied. It is much ſmaller than the panther; its body, which is nearly of the ſize of the lynx, being but about three feet and a half long. Its hair, as alſo its tail, are longer than thoſe of the panther. The latter frequently meaſures above three feet; though the body of this animal is at leaſt a third leſs than that of the panther, whoſe tail does not meaſure more than two feet, or two and a half at moſt. The hair of the ounce is of a whitiſh grey upon the back and ſides, and of a grey ſtill whiter under the belly; whereas the back and ſides of the panther are always of a yellow more or leſs deep. In both, however, the ſpots are nearly of the ſame form, and of the ſame ſize.

The third ſpecies is not mentioned by the ancients, as it belongs to Senegal, to Guinea, and to other ſouthern countries which they had not diſcovered. This animal we ſhall call *leopard;* a name which has been improperly applied to the large panther, but which, following the example of moſt travellers, we ſhall never uſe unleſs to denote the above-mentioned animal of Senegal. It is ſomewhat larger than the ounce, but conſiderably ſmaller than the panther, being only four feet long. The tail meaſures two feet or two feet and a half. On the back and ſides the hair is of a yellow colour more or leſs deep; under the belly it is whitiſh; the ſpots are annular, but ſmaller, and leſs regularly diſpoſed.

As each of theſe animals is different from the other, ſo each forms a diſtinct ſpecies. Our furriers call the ſkins of the firſt ſpecies *pantherſkins;* a name which, we ſhall not change. Thoſe of the ſecond ſpe-

Plate 7.


The Wolf.
The Panther.
The Ounce.
The Leopard.

J. Fraser sc.

ries they call *African tiger-ſkins*, which, being an equivocal name, we have ſet aſide, and adopted that of *ounce*. In ſhort, they improperly call *tiger-ſkins*, the ſkins of the animal which we have here denominated the leopard.

The ſpecies of the ounce ſeems to be more numerous, as well as more generally diffuſed than that of the panther. In Barbary, in Arabia, and in all the ſouthern parts of Aſia, Egypt perhaps excepted, it is very common. It is known even in China, where it is diſtinguiſhed by the name of *hinen-pao*.

The ounce is eaſily tamed, and is employed for the chace, in the hot climates of Aſia, where the dog is not to be found, unleſs introduced from other parts; and then it not only loſes its voice, but its inſtinct. Beſides, the panther, the ounce, and the leopard, are alike remarkable for bearing an antipathy to dogs, which they ſeize in preference to every other animal.

The Jaguar.

The jaguar reſembles the ounce both in diſpoſition and in ſize, and for the moſt part in the form of the ſpots with which his ſkin is diverſified. He is leſs terrible, leſs ferocious, than the panther and the leopard. The ground of his colour, like that of the latter, is a bright yellow, and not grey like that of the ounce. His tail is ſhorter than that of either of thoſe animals. His hair is longer than the panther's, but ſhorter than that of the ounce. It is frizzled while he is young, but ſmooth and ſtrait when he is full grown.

The jaguar lives by prey like the tiger; but a lighted brand will put him to flight, will deprive him of all courage, and vivacity. He ſeems to partake of the indolence ariſing from the nature of the climate; nor does he diſcover any activity or alertneſs, unleſs when preſſed by hunger.

Almoſt all the authors who have written the Hiſtory of the New World, have mentioned this animal; ſome under the name of *tiger*, or *leopard*, others under the names which it bears at Braſil, Mexico, &c. They alſo ſpeak of another animal of the ſame genus, and perhaps indeed of the ſame ſpecies, under the name of *jaguaret*, which we have diſtinguiſhed from the jaguar in our enumeration. Whether they are two diſtinct ſpecies, however, or only varieties of the ſame ſpecies, I cannot poſitively affirm, having ſeen only one of the two kinds.

The jaguar is found in Braſil, in Paraguay, in Tucuman, in Guiana, in the country of the Amazons, in Mexico, and in all parts of South America. The jaguaret appears to have been always more rare, or at leaſt this creature has always inhabited ſuch places as are more diſtant from the haunts of men; and the few travellers who have mentioned it, have only drawn their accounts from thoſe of Marcgravius and Piſo.

The Couguar.

The Couguar is as long but not ſo thick as the jaguar. He has a ſmall head, a long tail, ſhort hair, which is of a lively red colour, intermixed with a few blackiſh tints, particularly on the upper part of the back. He is neither marked with long ſtripes, like the tiger, nor with round and full ſpots, like the leopard, nor with annular ſpots, like the panther and the ounce. His chin and his neck are whitiſh, and all the inferior parts of his body. Though leſs ſtrong than the jaguar, he is as fierce, and perhaps more cruel. He appears too to be more greedy of prey; nor, when once ſeized, does he ever offer to relinquiſh it till he has fully glutted his voracious appetite.

This animal is not uncommon in Guiana. Formerly couguars were known to ſwim over in numbers to the iſland of Cayenne, to attack and devour the flocks, and were conſidered as a ſcourge to the colony. By degrees, however, the ſettlers leſſened their number, and at length expelled them entirely.

The couguar, by the agility of his body and the length of his legs, ſeems calculated to run, and to climb trees better than the jaguar. They are both equally remarkable for ſloth and cowardice when once they are ſatiated with prey; and ſeldom known to attack men, unleſs when they find them aſleep. They delight in the lofty ſhades of foreſts, where they hide themſelves in the covert of ſome thick tree, in order to dart forth on ſuch animals as paſs by. Though they live only upon prey, and quench their thirſt more often with blood than with water, yet it has been ſaid by ſome, that their fleſh is exceedingly palatable. Piſo ſays expreſsly, that it is as good as veal; and Charlevoix and others have compared it to mutton. It is hardly credible, however, from the above circumſtances, that it can be well taſted; and therefore I prefer the teſtimony of Deſmarchais, who ſays, that the beſt thing about this animal is his ſkin, with which they make houſings for horſes, and that its fleſh is of no value, being generally lean and of a diſagreeable flavour.

The Lynx.

The Lynx is an animal more commonly found in cold than in temperate climates; and is at leaſt very rare in hot ones. It was known to the Greeks and the Latins. Pliny ſays, that the firſt which were ſeen in Rome were brought, in the time of Pompey, from Gaul. At preſent they are not ſeen in France, a few perhaps excepted, belonging to the Alpine and Pyrenæan mountains. But the Romans, under the name of Gaul, comprehended ſeveral northern countries; and, beſides, modern France is far from being ſo cold as ancient Gaul was formerly.

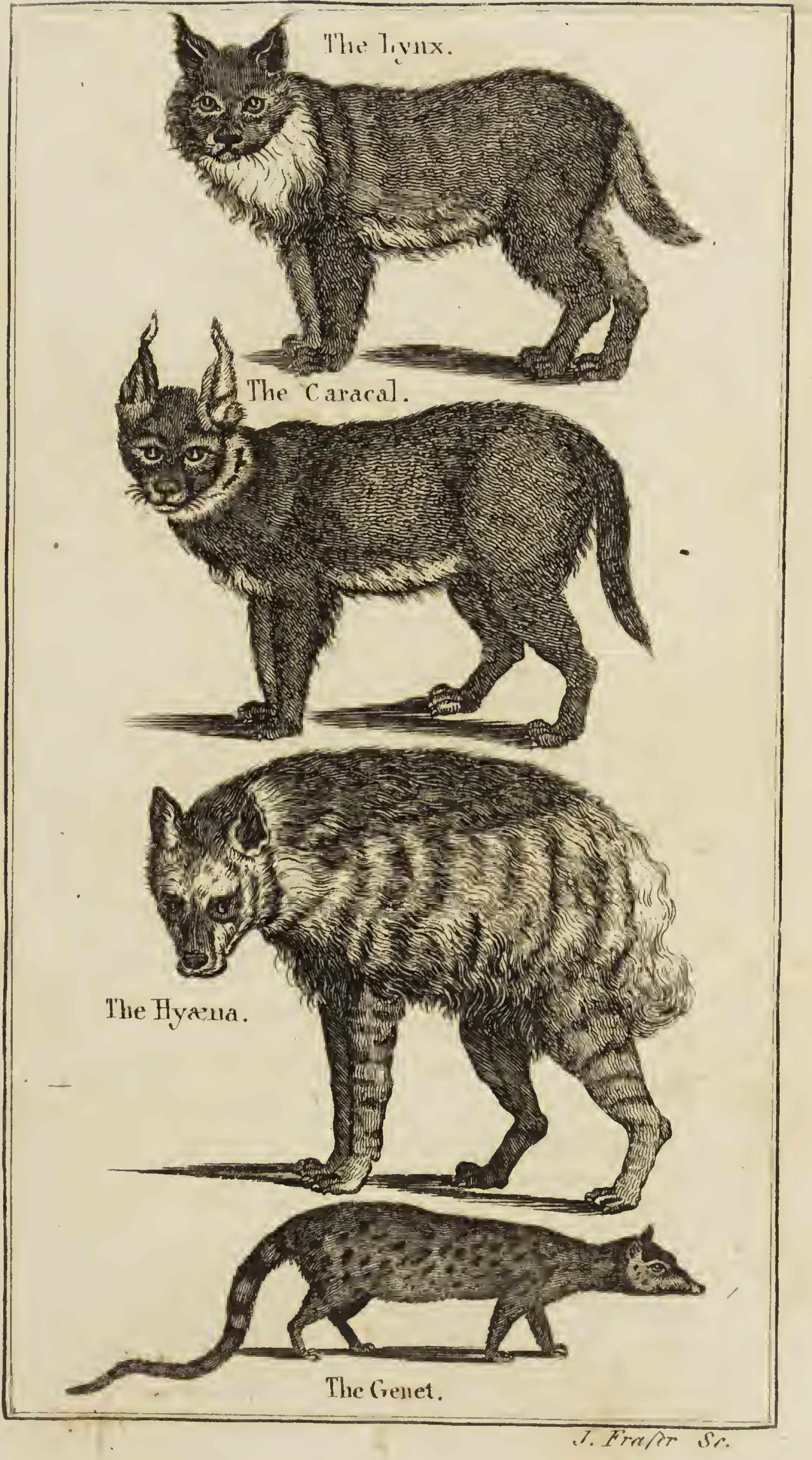
The moſt beautiful ſkins of the lynx are brought from Siberia, as belonging to the *lupus cervarius*, and from Canada, as belonging to the *felis-cervarius*. Becauſe they are like all other animals of the New Continent, ſmaller than thoſe of the Old World. In Europe they are compared to a wolf in ſize, and in Canada to a wild cat.

The lynx, of which the ancients have ſaid, that the ſight was ſo ſharp as to penetrate opaque bodies, and of which the urine was made to poſſeſs the marvellous property of hardening into a ſolid ſubſtance a precious ſtone, called *lapis lyncurius*, is an animal which never exiſted. To the true lynx this imaginary one has no affinity, but in name. We muſt not, therefore, as the moſt of naturaliſts have hitherto done, attribute to the former, which is a real being, the properties of this imaginary one, the exiſtence of which, Pliny himſelf does not ſeem diſpoſed to believe, and which he claſſes with the ſphynx, the pegaſus, and other prodigies, or monſters, the produce of Æthiopia.

Our lynx poſſeſſes not the wonderful quality of ſeeing through walls; but it has bright eyes, a mild aſpect, and, upon the whole, an agreeable and lively appearance. Its urine produces not precious ſtones, but, like the cat, an animal which it nearly reſembles, and of which it

retains

Plate 9.


The Lynx.
The Caracal.
The Hyæna.
The Genet.

J. Fraser Sc.

retains the manners, and even the cleanlineſs, it covers it over with earth.

The lynx has ſhort legs, and is generally about the ſize of the fox. It differs from the panther and the ounce in the following particulars. It has long hair, its marks or ſpots are of a colour leſs lively, and are badly diſpoſed. Its ears are ſurrounded at the extremity by a ſtripe, or rather tuft, of black hair: its tail, which is much ſhorter, is black at the tip: its eyes have a whitiſh caſt; and its countenance has ſomething in it more mild. The ſkin of the male is more beautifully marked than that of the female. It does not walk or run like the wolf in a progreſſive motion, but leaps and bounds like the cat. It gains its ſole ſubſiſtence by devouring other animals, which it will purſue to the very tops of trees. Neither can the wild cat, the martin, the ermine, nor the ſquirrel, eſcape its purſuit. It alſo ſeizes birds, lies in wait for the ſtag, the roebuck, and the hare, and often with one bound ſeizes them by the throat. When in poſſeſſion of its prey, it firſt ſucks the blood of the animal, and then lays open the head, in order to devour the brains. It then generally abandons the victim of its fury, goes in queſt of freſh prey, and is ſeldom known to return to the former; a circumſtance which has given riſe to the vulgar remark, that of all animals the lynx has the ſhorteſt memory. The ſkin of this animal changes its colour according to the ſeaſon and climate. In winter it is in every reſpect better than it is in ſummer; and its fleſh like that of all beaſts of prey, is improper food.

The Caracal, or Syaguſh.

Though the caracal reſembles the lynx in ſize, in the formation of the body, and the aſpect of the head; and, though like that animal, it ſeems to have the peculiar, and almoſt ſingular characteriſtic of a ſtripe of black hair at the extremity of the ears, I am inclined to treat of them as animals of different ſpecies.

The caracal is not ſpotted like the lynx; it has hair rougher and ſhorter, its tail is larger, and of an uniform colour; its ſnout is longer; in appearance it is leſs mild, and in diſpoſition it is fiercer. The lynx is an inhabitant of the cold, or at moſt of the temperate regions. The caracal, on the other hand, is only found in the hot countries; and it is as much from their difference in diſpoſition and climate that I have judged them to be of two different ſpecies, as from the inſpection and compariſon of the animals themſelves.

The caracal is common in Barbary, in Arabia, and in all thoſe countries which are inhabited by the lion, the panther, and the ounce. Like them it depends on prey for its ſubſiſtence; but, unlike them, from its inferior ſize, and its inferior ſtrength, it has much difficulty in procuring its prey. Hardly, indeed, has it any thing to ſubſiſt on but what the more potent carnivorous animals are diſpoſed to leave for it. It keeps at a diſtance from the panther, becauſe that animal exerciſes its cruelty even after he is ſatisfied with food; but it follows the lion, who, when the immediate cravings of his appetite are gratified, is of a pacific diſpoſition. From the refuſe of what this noble animal has devoured, the caracal frequently enjoys a comfortable meal. Sometimes, even while the lion is in ſearch of prey, by climbing trees, it braves his fury; for he cannot aſcend after it like the panther. For all theſe reaſons it is, that the caracal has been called the "lion's guide,"

guide," the "lion's provider;" and that the lion, whoſe ſmell is far from being acute, is ſaid to employ this animal to find out prey for him by its ſcent, of which, for its trouble, it enjoys the remains, when its maſter is ſatisfied.

The caracal is about the ſize of a fox, but much fiercer, and ſtronger. It has been known to attack, tear in pieces, and deſtroy in a few minutes, a large dog that exerted himſelf to the utmoſt. It is very difficult to tame this animal; yet, if taken when very young, and afterwards reared with care, it may be trained to the chace, to which it is by nature inclined, and in which it is ſure to ſucceed, provided it is not let looſe but againſt ſuch animals as are unable to reſiſt it. In India they make uſe of this animal to take hares, rabbits, and even large birds, all of which it ſeizes with ſingular addreſs.

The Hyæna.

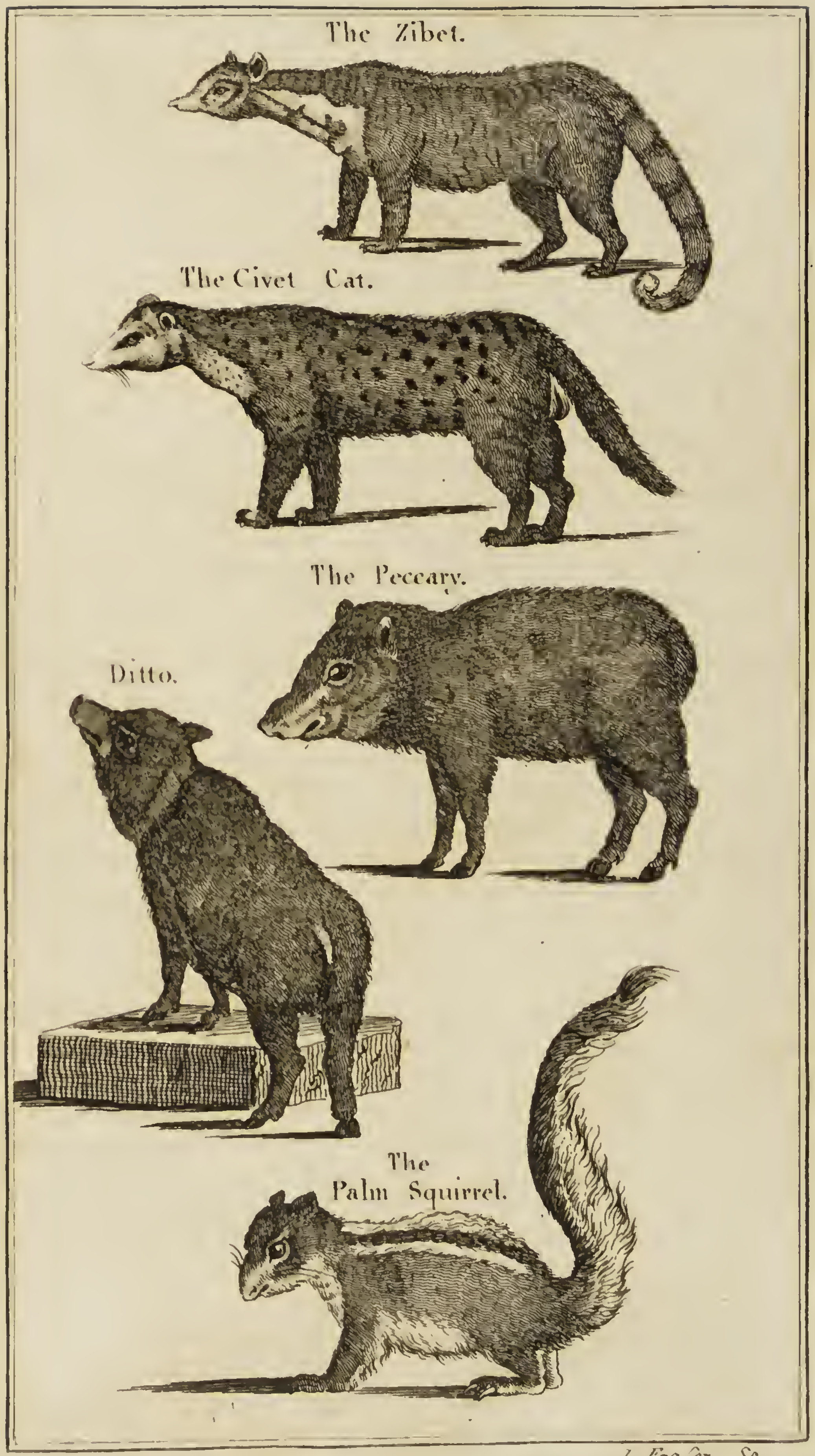
So ſtriking, and even ſo ſingular are the characteriſtics of the hyæna, that it is hardly poſſible to be deceived by them. It is, perhaps, the only quadruped which has but four toes to either the fore or hind feet. Like the badger it has an aperture under the tail, which does not penetrate into the interior parts of the body Its ears are long, ſtrait, and bare: its head is more ſquare and ſhorter than that of the wolf: its legs, the hind ones eſpecially, are longer: its eyes are placed like thoſe of the dog: the hair of its body, and its mane, are of a dark grey, with a ſmall intermixture of yellow and black, diſpoſed all along in waves; and though its ſize is equal to that of the wolf, yet it has a contracted appearance.

This ſolitary creature reſides in the caverns of mountains, in the clefts of rocks, or in dens, which it has formed for itſelf under the earth. Though taken very young, it is very incapable of being tamed. It lives by depredation, like the wolf; but it is a ſtronger animal, and ſeemingly more daring. It ſometimes attacks men, carries off cattle, follows the flocks, breaks open the ſheep-cotes by night, and ravages with an inſatiable voracity. Its eyes are keen and piercing and it is ſaid to ſee beſt at night. If we may credit all the naturaliſts who have treated of this animal, its cry reſembles the ſobs or reachings of a man in a violent fit of vomiting; but, according to Kœmpfer, who was an ear-witneſs of it, it ſounds like the lowing of a calf.

The hyæna defends itſelf againſt the lion, is not afraid of the panther, and attacks the ounce, which is incapable of reſiſting it. When at a loſs for other prey, it ſcrapes up the earth with its feet, and devours the carcaſes both of animals and men, which, in the countries that it inhabits, are interred promiſcuouſly in the fields. We find this creature in almoſt all the hot climates of Africa, and of Aſia; and it ſeems probable that the animal called *faraſſe*, at Madagaſcar, which reſembles the wolf in figure, but which is larger, ſtronger, and more cruel, may be the *hyæna*.

Of few animals, have ſo many abſurd ſtories been told as of this. The ancients repreſent it as being male and female alternately. It appears, however, that the circumſtance which gave riſe to this fable, is, the opening in the form of a cleft, which both the male and the female have, independently of the parts deſtined for the purpoſes of generation. It has been affirmed too, that this creature could imitate the human voice, that it remembered the names of the ſhepherds, called to them, charmed,

Plate 10.


The Zibet.
The Civet Cat.
The Peccary.
Ditto.
The Palm Squirrel.

J. Fraſer Sc.

charmed them, rendered them motionleſs; that, at the ſame time, it gave chace to the ſhepherdeſſes, made them forget their flocks, and be diſtracted with love, &c. All theſe things might ſurely happen without the intervention of an hyæna; and I conclude this article, in order to avoid the reproach which is due to Pliny, of ſeeming to take a pleaſure in compiling and publiſhing fables.

The Civet and the Zibet.

It has been the opinion of moſt naturaliſts, that there is only one ſpecies of animals that furniſhes the perfume known by the name of *civet*. I, however, have ſeen two that furniſh it, and which, though reſembling each other in the eſſential affinities of conformation, do yet differ from each other in ſo many other characteriſtics, that there is ſufficient reaſon to conſider them as forming different ſpecies.

To the firſt of theſe animals I have appropriated its original name of *civet*; and to the ſecond I have given that of *zibet*.

This latter animal differs from the civet, in having a body longer and ſmaller, a ſnout more ſlender, flatter, and ſomewhat concave at the upper part. Its hair is much ſhorter and ſofter. It has no mane, no black under the eyes, or upon the cheeks. All theſe characteriſtics are peculiar to the civit. Some travellers had already ſuſpected that there were two ſpecies of civets; but no perſon had diſtinguiſhed them with ſufficient accuracy to deſcribe them.

Theſe animals have been called *muſk cats*, or civet-cats; yet they have nothing in common with the cat. They rather reſemble the fox, eſpecially in the head. Their coat is diverſified with ſtripes and ſpots; a circumſtance which has occaſioned them to be miſtaken for ſmall panthers, by perſons who had only ſeen them at a diſtance. In every other reſpect, however, they differ from the panther. The perfume of the civet is very ſtrong, and that of the zibet is ſtrong to an exceſs.

This humour is found in the opening which each of theſe animals has near the parts of generation; and though the odour is ſo ſtrong, it is yet agreeable, even when it iſſues from the body of the animal. The perfume of the civet we muſt not confound with muſk, which is a ſanguineous humour obtained from an animal altogether different from either the civet, or the zibet. The animal that furniſhes the muſk is a kind of roe buck without antlers, or goat without horns; nor does it poſſeſs any property in common with the civet but that of furniſhing a ſtrong perfume.

The civets, though natives of the hotteſt climates of Africa, and of Aſia, are yet capable of living in temperate, and even in cold countries, if they are carefully defended from the injuries of the air, and provided with delicate and ſucculent food. In Holland, where no ſmall emolument is derived from their perfume, they are frequently reared. The perfume of Amſterdam is eſteemed preferable to that which is brought from the Levant, or the Indies, which is generally leſs genuine. That which is imported from Guinea would be the beſt of any, were it not that the Negroes, as well as the Indians and the people of the Levant, adulterate it with mixtures of laudanum, ſtorax, and other odorous drugs.

Thoſe who breed theſe animals for the ſake of their perfume, put them in a long and narrow box, in which they cannot turn. This box the perſon who is employed to collect the perfume opens behind, for this purpoſe, twice or thrice a week; and, dragging the animal which is confined in it backward by the tail, he keeps it in this poſition by a bar before. This done, he takes out the civet with a ſmall ſpoon. The perfume thus obtained, is put into a veſſel; and great care is taken to keep it cloſely ſhut.

The quantity which a ſingle animal will afford, depends greatly upon its appetite, and the quality of its nouriſhment. It furniſhes more, in proportion as it is more delicately and abundantly fed. Raw fleſh haſhed ſmall, eggs, rice, ſmall animals, birds, young fowls, and particularly fiſh, are the favourite food of the civit.

The civet is a wild, fierce animal, and, though ſometimes tamed, is yet never very familar. Its teeth are ſtrong and ſharp; but its claws are feeble and blunt. It is light and active, and lives by prey, purſuing birds, and other ſmall animals, which it is able to overcome. They are ſomtimes ſeen ſtealing into yards and outhouſes, like the fox, in order to carry off poultry. Their eyes ſhine in the night; and it is very probable that they ſee better by night than by day. When they fail of animal food, they are found to ſubſiſt upon roots and fruits. They very ſeldom drink; nor do they ever inhabit humid ground; but in burning ſands, and in arid mountains, they cheerfully remain.

The Genett.

The Genett is an animal ſmaller than the civet. It has a long body, ſhort legs, a ſharp ſnout, and a ſlender head. Its fur, which is exceedingly ſmooth and ſoft, is of an aſh-colour, gloſſy, and marked with black ſtripes, which are ſeparate upon the ſides, but which unite upon the back. It has alſo upon its neck a kind of mane, which forms a black ſtreak from the head to the tail, which laſt is as long as the body, and is marked with ſeven or eight rings, from the inſertion to the tip, which are alternately black and white.

The genett has under the tail, and in the very ſame place with the civet, an opening, in which is ſeparated a kind of perfume reſembling civet, but leſs ſtrong, and apter to evaporate. It is an animal ſomewhat larger than the martin, which it is very like, not only in the form of the body, but alſo in diſpoſition and habit, and from which it ſeems chiefly to differ in being more eaſily tamed.

The Ondatra, and the Deſman.

The Ondatra and the Deſman, are two animals which muſt not be confounded, though they have both been denominated *muſk-rats*, and though they have a few common characteriſtics.

The ondatra, or muſk-rat of Canada, differs from the deſman in having its toes all ſeparated from each other, in having eyes very conſpicuous, and a very ſhort ſnout. The deſman or muſk-rat of Muſcovy, on the other hand, has the toes of its hind feet united by a membrane. The tail of both is flat; and not only in this circumſtance, but in a number of eſſential characteriſtics, they differ from the pilori, or muſk-rat of the Antilles.

The ondatra is of the ſize of a ſmall rabbit, and of the form of a rat. Its head is ſhort, and ſimilar to that of the water-rat; its hair is ſoft and gloſſy, with a very thick down underneath, nearly like that of the beaver. Its tail is long, and, though of a different form, covered with little ſcales, in the ſame manner as thoſe of other rats. Its ears are very ſhort, but not bare, like thoſe of the domeſtic rat.

The ſtriking ſingularities which have been remarked in the ondatra, are, the force and great expanſion of the muſcles of the ſkin, the ſuppleneſs of the falſe ribs, which permits ſo conſiderable a contraction of the body, that the muſk-rat is known to obtain an eaſy entrance into holes too narrow for the admiſſion of animals much ſmaller than itſelf. The manner too in which the female voids her urine, is a very ſtriking characteriſtic; the urethra not terminating, as in other quadrupeds, but at a hairy eminence ſituated over the os pubis. The teſticles, alſo which, as in other rats, are ſituated on each ſide of the anus, become prodigiouſly large while the ardour for propagation laſts. Add to theſe that the veſſels which contain the muſk or perfume of this animal, under the form of a milky humour, and which adjoin to the parts of generation, undergo the ſame changes; that, during the rutting ſeaſon, they enlarge and ſwell to a very great degree; that they decay ſoon after, and are at length totally effaced. The change in the bags which contain the prefume is effected more quickly, as well as more completely, than that of the parts of generation. They are common to both ſexes, and contain a very copious milky ſubſtance, while the animals are hot.

From the ondatra being a native of the ſame country with the beaver, and from its figure, its colour and its hair, they have been often compared with each other.

In diſpoſition and inſtinct alſo, theſe animals bear a conſiderable reſemblance to each other. Like the beavers, the ondatras live in ſociety during the winter. They form little dwellings, about two feet and a half, and ſometimes more, in diameter; and in theſe there is often found an aſſociation of ſeveral families. To ſuch habitations they do not reſort in order to ſleep for five or ſix months, like the marmots; their only object is, to obtain from them a ſhelter from the inclemency of the weather. They are of a round form, and are covered with a kind of cieling about a foot thick. The materials of which they are compoſed are ruſhes and certain herbs interwoven, and conſolidated with ſome clay, which they previouſly prepare for that purpoſe with their feet.

Theſe animals breed once a year, and generally produce five or ſix at a time. So ſtrong are their fore teeth, and ſo excellently calculated for gnawing, that, when one of them is ſhut up in a box, it preſently makes a hole to eſcape through, if the wood were of the hardeſt kind.

Theſe animals are little inclined to ferocity, and, when taken young, are eaſily tamed. In the very early period of life they are alſo, which might not be expected, exceedingly handſome; for then the long, and almoſt bare tail, which renders their figure very diſagreeable afterwards, is very ſhort. They play with all the innocence and ſprightlineſs of young cats; they never bite, and might be eaſily reared, were it not for their obnoxious ſmell.

CHAP.

CHAP. XV.

OF THE PECCARY, OR MEXICAN HOG—OF THE TERNAT BAT—THE SPECTRE—THE FLYING SQUIRREL—THE GREY SQUIRREL—THE PALM SQUIRREL, AND THOSE OF BARBARY, &C.—THE ANT-EATERS—THE SHORT AND LONG-TAILED MANIS—THE ARMADILLO—THE SPOTTED CAVY—THE OPOSSUM—THE MARMOSE—THE CAYOPOLIN.

The Peccary, or Mexican Hog.

AMONG the animals of the New World, we meet with few ſpecies more numerous, or more remarkable, than that of the peccary, or Mexican hog. At the firſt glance, this animal reſembles our wild boar, or rather the hog of Siam, which, as we have already obſerved, is, like our domeſtic hog, a variety of the wild boar, or wild hog; and for this reaſon it has been called the boar or hog of America. The peccary, however, is of a diſtinct ſpecies, and refuſes to engender either with the wild boar or the hog. It differs, however, from the hog, in a number of characteriſtics, both external and internal. It is leſs corpulent, and its legs are ſhorter. In the ſtomach and inteſtines there is a difference of conformation. It has no tail, and its briſtles are much ſtronger than thoſe of the wild boar; and, laſtly, it has, upon that part of the back which borders upon the buttocks, an opening from which there is diſcharged in ichorious humour of a very diſagreeable ſmell. The peccary is the only animal which has an opening in this region of the body. In the civets, the badger, and the genett, the reſervoir for the perfume is ſituated beneath the parts of generation; and in the muſk-animals we find it under the belly.

The peccary may be rendered a domeſtic animal, like the hog, and has, pretty much the ſame habits and natural inclinations. It feeds upon the ſame aliments; and its fleſh, though more dry and lean than that of the hog, is not unpalatable.

Theſe animals are extremely numerous in all the parts of South America. They generally herd two or three hundred together, and unite, like hogs, in the defence of each other. They are particularly fierce when any attempt is made to rob them of their young. They ſurround the plunderer, attack him without fear, and frequently his life falls a victim to his raſhneſs.

In its native country, the peccary is more fond of the mountainous parts, than of the low and level grounds. It ſeems to delight neither in the marſhes, nor the mud, like our hogs. It keeps among the woods, where it ſubſiſts upon wild fruits, roots, and vegetables. It is alſo an enemy to the lizard, the toad, and all the ſerpent kinds with which the uncultivated foreſts of the New Continent abound. As ſoon as it perceives a ſerpent, or a viper, it at once ſeizes it with its fore hoofs and teeth, fleas it an inſtant, and devours its fleſh.

The peccary, like the hog, is very prolific. The young ones follow the dam, and do not ſeparate from her till they have attained maturity. If taken at firſt, they are very eaſily tamed, and ſoon loſe all their natural ferocity: they, however, never diſplay any remarkable ſigns of docility. They only continue to do no miſchief; and they may be permitted to run tame, without any dangerous conſequences. They ſeldom ſtray far from home; they return of themſelves to the ſty, and do not quarrel among each other, except when they happen to be fed in common. When enraged, they draw their breath with great force, and their briſtles point up ward, and do not reſemble the briſtles of the wild boar ſo much as the ſharp armour of the hedge-hog

The Rouſſette, or Ternat Bat, the Rougette†, and the Vampyre, or Spectre‡.*

The rouſſette, and the rougette, ſeem to form two diſtinct ſpecies, which, however, are ſo like each other, that they ought not, in my opinion, to be claſſed together. The latter differs from the former ſolely in the ſize of the body, and the colours of the hair. The rouſſette, whoſe hair is of a reddiſh brown is nine inches long from the tip of the noſe to the inſertion of the tail, and three feet broad, when the membranes, which ſerve it for wings, are fully extended. The rougette, whoſe hair is of a reddiſh aſh-colour, is hardly more than five inches and a half long, and two feet broad; and its neck is half-encircled with a ſtripe of hair of a lively red, intermixed with orange-colour, of which we perceive no veſtige on the neck of the rouſſette. They both belong nearly to the ſame hot climates of the Old Continent. We meet with them in Madagaſcar, in the iſland of Bourbon, in Ternato, in the Philippine, and other iſlands of the Indian Archipelago, where, indeed, they ſeem to be more general than in the neighbouring continents.

In the hotter countries of the New World, we likewiſe meet with another flying quadruped, of which we know not the American name, but to which I will affix that of ſpectre, or vampyre, becauſe it ſucks the blood of men, and of animals, while they are aſleep, without awaking them. This American animal is of a ſpecies different from thoſe of the rouſſette and the rougette, which are both to be found ſolely in Africa, and in the ſouthern parts of Aſia.

The ſpectre is ſmaller than the rougette, which is itſelf ſmaller than the rouſſette. The former, when it flies, ſeems to be of the ſize of a pigeon; the ſecond of the ſize of a raven; and the third of the ſize of a large hen. Of both the rouſſette, and the rougette, the head is tolerably well ſhaped; the ears are ſhort, and nearly like that of a dog. Of the ſpectre, on the contrary, the noſe is longer; the aſpect is as hideous as that of the uglieſt bats; the head is unſhapely, and ſurmounted with large ears, very open, and very ſtraight; its noſe is disfigured. Its noſtrils reſemble a funnel, and have a membrane at the top, which riſes up in the form of a ſharp horn, or cock's comb, and adds greatly to the deformity of its face.

There is no doubt, therefore, but that the ſpecies of the ſpectre is different from thoſe of the rouſſette and the rougette. It is an animal not leſs miſchievous than it is deformed. It is the peſt of man, the torment and the deſtruction of animals. In confirmation of this truth, a more authentic teſtimony cannot be produced than that of M. de la Condamine. "The bats," ſays he, "which ſuck the blood of horſes, of mules, and even of men, when they do not guard againſt it by ſleeping under the ſhelter of a pavilion, are a ſcourge common to moſt of the hot countries of America. Of theſe are ſome of a monſtrous ſize. At

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* Vulgarly called the *flying dog*, and, by the generality of naturaliſts, the *great bat of Madagaſcar*.

† Vulgarly called the *red-necked flying dog*.

‡ An American animal, which has hitherto been ſolely indicated under the vague names of *great American bat*, or *flying dog of New Spain*.

Borja, and ſeveral other places, they have entirely deſtroyed the large cattle which the miſſionaries had brought thither, and which had begun to multiply."

The rouſſette and rougette are larger, ſtronger, and perhaps even more miſchievous than the vampyre; but, it is by open force, and in the day as well as in the night, that they commit hoſtilities. Fowls and ſmall animals are the objects of their deſtructive fury. They attack men too, and bite their faces moſt cruelly; but no traveller has accuſed them of ſurprizing men and animals, while aſleep, and of taking ſuch opportunities to ſuck their blood.

All theſe bats are carnivorous, and moſt voracious animals. In a dearth of fleſh or fiſh, they feed on vegetables and fruits of every kind. As they are fond of the juice of the palm-tree, ſo it is eaſy to take them by placing in the neighbourhood of their retreat a few veſſels filled with palm-tree water, or any other fermented liquor. They faſten to, and ſuſpend themſelves from trees with their claws. They are uſually ſeen in troops, and oftener by night than by day. They ſhun places that are much frequented; and their favourite reſidence is in the deſerted parts of iſlands.

I have frequently thought it worth while to examine how it is poſſible that theſe animals ſhould ſuck the blood of a perſon aſleep, without cauſing, at the ſame time, a pain ſo ſenſible as to awake him. Were they to cut the fleſh with their teeth, or with their claws, the pain of the bite would effectually rouſe any of the human ſpecies, however ſoundly aſleep. It is only with their tongue therefore that it is poſſible for them to make ſuch minute apertures in the ſkin, as to imbibe the blood through them, and to open the veins without cauſing an acute pain.

I have not had an opportunity of obſerving the tongue of the vampyre; but that of ſeveral rouſſettes, which Mr Daubenton has attentively examined, ſeems to indicate the poſſibility of the fact. It is ſharp, and full of prickles directed backward; and it is probable, that theſe prickles, or points, from their exceeding minuteneſs, may be inſinuated into the pores of the ſkin, may enlarge them, and may penetrate them ſo deep, as to command a flow of the blood by the continued ſuction of the tongue. But theſe circumſtances are perhaps exaggerated, or erroneouſly related, by the writers who have tranſmitted them to us.

The Flying Squirrel.

The flying ſquirrel is of a particular ſpecies, and reſembles in few particulars either the ſquirrel or the rat. He is more common in America than in Europe, where he is ſeldom ſeen, except in Lithuania and Ruſſia. This little animal dwells upon trees, like the ſquirrel. He goes from branch to branch; and when he leaps upon another tree, his ſkin, which hangs looſe on both ſides of his body, is ſtretched forward by his fore legs, and backward by the hind legs, and increaſes the ſurface of his body, without adding to its weight, and conſequently retards the acceleration of his fall; ſo that this animal with one leap, bounds to a great diſtance. This motion is not like the flight of a bird, neither like the fluttering of a bat; both which motions are made by ſtriking the air with repeated vibrations. It is one ſingle leap, effected by the firſt impulſe, the motion of which is only prolonged, and longer, as the body of the animal, preſenting to the air the greater ſurface, finds a greater reſiſtance, and falls more ſlowly.

The flying ſquirrel is eaſily tamed; but he often flies; and he muſt be kept in a cage, or tied with a ſmall chain. He feeds upon bread, fruit, and ſeeds. He is remarkably fond of the buds and ſhoots of the birch and pine trees. He does not ſeek after nuts and almonds, like the ſquirrel. He makes a bed of leaves, in which he buries himſelf, and upon which he lies in the day time, and leaves it in the night, or when preſſed by hunger. As he has little agility, he becomes eaſily the prey of martins, and other animals, which climb up the trees; ſo that the ſpecies is not greatly multiplied, although they have commonly three or four young at a time.

The Grey Squirrel.

The grey ſquirrel is found in the northern parts of both continents, and is in ſhape like a common ſquirrel, but larger. The colour of his hair is not red, but light, or deep grey; and his ears are not ſo hairy towards the extremity, as thoſe of our ſquirrels. Many authors think the ſpecies is different in Europe and America; that the grey ſquirrels of Europe are of the common kind, and that they change their colour according to the ſeaſon, in the northern climates. Without denying this aſſertion, which does not however, ſeem ſufficiently proved, we conſider the grey ſquirrel of Europe and America as the ſame animal, and as a diſtinct ſpecies, ſeparated from that of common ſquirrels, who are found in the northern parts of both Continents, being of the ſame ſize and of the ſame colour; that is, of a red, more or leſs bright, according to the temperature of the country.

We have very little information with regard to the grey ſquirrel. Fernandez ſays, that the grey, or blackiſh ſquirrel of America dwells commonly upon trees, particularly pines; that he feeds upon fruits and ſeeds; that he lays up ſtore for the winter, in ſome hollow tree, whither he retires during that ſeaſon. The grey ſquirrel alſo differs from the others in making his neſt at the top of trees like birds.

The Palm-Squirrel, and thoſe of Barbary and Switzerland.

The palm-ſquirrel is as large as a rat, or a ſmall ſquirrel. He lives upon the palm-trees, from which he takes his name: Some call him the palmiſt rat, and others the palm-tree ſquirrel; and as he is neither of the ſpecies of a rat nor a ſquirrel, we ſhall call him palmiſt. His head is very near of the ſame form as that of the ſhort-tailed field mouſe, and covered with rough hair. His long tail does not lie on the ground like that of the rat. He carries it erect vertically, without however laying it on his body, as the ſquirrel, it is covered with hair longer than that of his body, but much ſhorter than the hair of the ſquirrel's tail. His back is variegated with white and brown ſtripes, which diſtinguiſh the palmiſt from all other animals, except the ſquirrels of Barbary and Switzerland.

With reſpect to the ſquirrel of Barbary, as he is of the ſame continent, and of the ſame climate, of the ſame ſize, and very near the ſame form as the palmiſt, one ſhould be inclined to think, that they are both of the ſame ſpecies, with ſome variety; yet there is ſtill reaſon to believe them to be different animals. We have ſeen all the varieties in the king's cabinet. The ſquirrel of Barbary has the head and forehead more crooked, the ears longer, the tail more buſhy than the palmiſt; he is more like a rat than a ſquirrel. The ſquirrel of Barbary has four white ſtripes, and the palmiſt has no more than three. The white ſtripe is on the palmiſt's back bone; on the contrary, that of the ſquirrel of Barbary on the ſame part of his body is brown and red. Theſe animals, indeed, have very nearly the ſame habits, and are of the ſame nature as the common ſquirrel. They are both of a pretty figure. Their coat with white ſtripes is more valuable than that of the ſquirrel. Their ſhape is ſhorter, their body lighter, and their motions quicker. The palmiſt, and the ſquirrel of Barbary, dwell on trees like the common ſquirrel, but the Swiſs ſquirrel lives upon earth, and like the field-mouſe, forms a retreat that the water cannot penetrate. He is alſo leſs docile and leſs gentle than the two others. He bites without mercy, (except he is lately tamed,) and he is more like a rat, or a field-mouſe, than a ſquirrel, by inſtinct and nature.

The Tamanoir, the Tamandua, and the Fourmiller, or Ant-eater.

South America produces three ſpecies of animals, with a long ſnout, a ſmall mouth, and no teeth, with tongues of a round form, and remarkably long; with which they penetrate into the ants neſts, and draw out the ants, which is their principal food. The firſt of theſe ant-eaters is that which the Braſilians call tamandua guacu, or great tamandua, to whom the French that are in America have given the name of tamanoir. This animal is about four feet from the extremity of the ſnout to the origin of its tail; his head is fourteen or fifteen inches long, his ſnout ſtretches out to a great length; his tail, two feet and a half long, is covered with rough hair, which is above a foot long. His neck is ſhort, his head narrow, his eyes black and ſmall, his ears round, his tongue thin, more than two feet long, which he folds again in his mouth, after he draws it entirely out. His legs are but one foot high: the fore-legs are a little higher and more ſlender than thoſe behind: he has round feet: the fore-feet are armed with four claws, the two middle ones are the longeſt; and thoſe behind have five claws. The hair of his head and body is black and white; this animal turns his tail up on his back, and covers his whole body with it, when he is inclined to ſleep, or wiſhes to ſhelter himſelf from the rain or the heat of the ſun. The long hair of his tail and of his body is not round in all its extent: it is flat towards the end, and feels like dry graſs He waves his tail frequently and haſtily when he is irritated, but it hangs down when he is compoſed, and he ſweeps the ground with it as he goes. The tamanoir walks ſlowly: a man can eaſily overtake him in running: his feet ſeems leſs calculated to walk than to climb, and to faſten round bodies; and he holds a branch or a ſtick ſo faſt, that it is impoſſible to ſnatch either from him.

The ſecond of theſe animals is that which the Americans called only tamandua, and to whom we ſhall give this name: he is much ſmaller than the tamanoir: he is not above eighteen inches from the extremities of the ſnout to the rump: his head is five inches long, his ſnout crooked, and flat and long below. He has a tail ten inches long, without hair at the end: his ears are erect and about an inch long, his tongue is round, and eight inches long, placed in a ſort of gutter or hollow canal within the lower jaw: his legs are not above four inches long: his feet are of the ſame form, and have the ſame number of claws as thoſe of the tamanoir. He climbs up, and holds a branch or a ſtick faſt, like the tamanoir, and his march is equally ſlow. He does not cover himſelf with his tail, which cannot ſhelter him, being almoſt bare; the hair of the fore-part is ſhorter than that of the tamanoir; when he ſleeps he hides his head under his neck and his fore-legs.

The third of theſe animals is that which the naturaliſts of Guiana call ouatiriouaou, unto which we appropriated the name of fourmiller, or ant-eater, to diſtinguiſh him from the tamanoir and tamandua. He is ſtill much ſmaller than the tamandua, being not above ſix or ſeven inches long from the extremities of the ſnout to the tail: his head is two inches long: the ſnout is not near ſo long as that of the tamanoir, or the tamandua: his tail is ſeven inches long, but is bent and is bare at the end: his tongue is narrow, long, and flat: his neck is almoſt bare, the head is large in proportion to the body, his eyes placed low, at a little diſtance from the corners of the mouth, his ears are ſmall, and hidden by the hair: his legs are but three inches high, his fore-feet have no more than two claws, of which the exterior is much longer than the interior: his hind-feet have four claws. He feels ſmooth, his colour is ſhining, diverſified with red and yellow: his feet are not made to walk, but to climb up, and to take hold of branches of trees, on which he hangs himſelf by the extremity of the tail.

Theſe three animals, ſo different in the ſize and proportions of the body, have, nevertheleſs, many things in common, with regard to conformation and their natural inſtinct. All three feed upon ants, and ſuck honey and other liquid and viſcous ſubſtances: they gather crums of bread and ſmall pieces of meat with great dexterity: they are eaſily tamed and domeſticated: they can ſubſiſt a long while without food: they do not ſwallow all the liquor which they keep in their mouth, one part of it iſſues out of their noſtrils: they commonly ſleep in the day time, and change their ſtation in the night: they are ſo ſlow, that a man may overtake them eaſily whilſt running in open ground. The ſavages eat their fleſh, which has a diſagreeable taſte.

The tamanoir looks at a diſtance like a great fox, and for that reaſon ſome travellers call him the American fox. He is ſtrong enough to defend himſelf againſt a large dog, and even a jaguar. When he is attacked he fights ſtanding on his hind-legs, like the bear, and makes uſe of his fore claws, which are murdering weapons, for his protection. He then lies on his back to uſe his hind-legs, and in this ſituation he is almoſt invincible; and even after he has put his adverſary to death, he keeps his hold a long time. He is covered with long buſhy hair, and a very thick ſkin; beſides, his fleſh is remarkably hard, and he ſeldom loſes his life in theſe engagements.

The tamanoir, the tamandua, and the fourmillier, are natives of the hotteſt climates only of America. They are found in Braſil, in Guiana, and in the country of the Amazons, &c. They do not breed in Canada, nor in other frozen regions of the New World, and do not belong conſequently to the Ancient Continent.

The Pangolin and Phatagin; or the ſhort and long-tailed Manis.

Theſe animals are commonly known under the name of ſcaly lizards; but we think proper to reject this denomination; 1, becauſe it is a compound; 2, becauſe it is ambiguous, and applied to both ſpecies; becauſe theſe animals are not only of another kind, but even of another claſs than the lizards, which are oviparous reptiles, while the pangolin and the phatagin are viviparous quadrupeds.

All the lizards are wholly covered, even under the belly, with a ſleek ſpeckled ſkin, like ſkales, but the pangolin and the phatagin have no ſcales under their throat, on the breaſt, or the belly. The phatagin, however, like the other quadrupeds, has hair on all theſe under parts of the body; but the pangolin has nothing but a ſmooth ſkin without hair. The ſcales with which all the other parts of the body of theſe two animals are covered, do not ſtick to the ſkin. They only adhere to it below; and they are moveable like the prickles of the porcupine. Theſe ſcales are ſo large, ſo hard, and ſo ſharp, that they frighten and diſcourage all animals of prey. It is an offenſive armour which wounds while it reſiſts.

The moſt cruel and the moſt voracious animals, ſuch as the tiger and the panther, make but uſeleſs efforts to devour theſe armed animals. They tread upon them, roll them, but when they attempt to ſeize them, they are grievouſly wounded. They can neither terrify them by violence, nor cruſh them with their weight.

When the pangolin and the phatagin contract themſelves, they do not, like the hedge-hog, aſſume a globular and uniform figure. They form an oblong coat of armour; but their thick and long tail remains outward, and incircles their bodies. This exterior part, by which it ſeems theſe animals might otherwiſe be ſeized, carries its own defence. It is covered with ſcales equally hard and ſharp with thoſe which cover the body, and as it is convex above, and flat below, in the form of half a pyramid, the ſides are covered with ſquare ſcales folded in a right angle, as thick and as ſharp as the others. Hence the tail ſeems to be ſtill more ſtrongly armed than the body, the under parts of which are unprovided with ſcales.

The pangolin, or ſhort-tailed manis, is larger than the phatagin, or long-tailed kind; his fore-feet are covered with ſcales, but the phatagin's feet, and part of his fore-legs have none, being only clothed with hair. The pangolin has alſo larger ſcales, thicker, more convex, and not ſo cloſe as thoſe of the phatagin, which are armed with three ſharp points. The ſcales of the pangolin on the contrary, are without points, and uniformly ſharp. The phatagin is hairy upon the belly, and the pangolin has no hair on that part of the body, but between theſe ſcales which cover his back, there are ſome thick and long hair like the briſtles of a hog, which are not found on the back of the phatagin.

The pangolin is from ſix to eight feet long, including his tail, which is very near as long as the body, though it appears ſhorter when young. The ſcales are not then ſo large nor ſo thick, and are of a pale colour, which is deeper when the animal is adult: they acquire ſuch a hardneſs, that they reſiſt a muſket ball. Like the ant eaters, the pangolin and the phatagin live chiefly upon ants: they have alſo a very long tongue, a narrow mouth, and appear to be without teeth. Their body and their tail are alſo very long, and the claws of their feet very near of the ſame length and the ſame form, but equal in number. The ant-eaters are found in America. The pangolin and the phatagin in the Eaſt Indies, and in Africa, where the negroes call them quogelo, and eat their fleſh, which they reckon a wholeſome food. They alſo uſe their ſcales for different purpoſes. The pangolin, and the phatagin have nothing diſagreeable but their figure; they are gentle, harmleſs, and innocent: they feed upon inſects only: they never run faſt, and can only eſcape the purſuit of men by hiding themſelves in hollow rocks, or, in holes which they dig for themſelves. They are two extraordinary ſpecies, not numerous, nor very uſeful; and their odd form ſeems to rank them as an intermediate claſs betwixt the quadrupeds and the reptiles.

The Armadillo.

When a quadruped is mentioned, the very name carries the idea of an animal covered with hair; and yet nature, as if willing to deviate from this characteriſtic uniformity, very frequently aſtoniſhes us by uncommon productions. The quadruped animals, which we regard as the firſt claſs of living nature, and who are, next to man, the moſt remarkable beings of this world, are not ſuperior in every thing, nor ſeparated by conſtant attributes. The firſt of theſe characters, which conſtitutes their name, and which conſiſts in having four feet, is common to lizards, frogs, &c. which, however, differ from the quadrupeds in many other reſpects, and form a diſtinct claſs. The ſecond general property, to produce young alive, is not peculiar to quadrupeds, ſince it is common with whales and other fiſhes of that claſs. And the third attribute, that of being covered with hair, exiſts not in ſeveral ſpecies, which cannot be excluded from the claſs of the quadrupeds, ſince, this characteriſtic excepted, they agree with them in every other reſpect.

Under the general name of armadillo, we may reckon ſeveral ſpecies which ſeem to us really diſtinct; in all of which the animal is protected by a cruſt that reſembles bone. This cruſt externally covers the head, the neck, the back, the flanks, the buttocks, and the tail to the very extremity. It is covered by a thin ſkin, ſleek and tranſparent: the throat, the breaſt, and the belly, which preſent a white grainy ſkin, like that of a plucked fowl. Beſides by viewing theſe parts with attention, you will perceive the appearance of ſcales which are of the ſame ſubſtance as the cruſt. This cruſt however, is not of one piece, like that of the turtle; it conſiſts of ſeveral joined to each other by as many membranes, which put this armour in motion. The number of theſe natural bands does not depend on the age of the animal; for the young armadillo and the adults, have in the ſame ſpecies the ſame number. Father d'Abbeville has diſtinguiſhed ſix ſpecies of the armadillo, but the principal difference between them conſiſts in the number of diviſions in the armour of the different ſpecies.

The armadilloes in general are innocent, harmleſs animals; but if they can get into gardens, they will eat melons, potatoes, pulſe, and roots. Though originally natives of the hot climates of America, they live in temperate regions. I once ſaw one in Languedoc, which was fed at home, and went every where without doing any damage or miſchief. They walk quickly, but they can neither leap, run, nor climb up trees. They have then no other reſources but to hide themſelves in their holes, or, if they are at too great a diſtance from them, they contrive to dig one before they are overcome; for they are as expert as the mole herſelf in digging the ground. They are ſometimes caught by the tail before they are out of ſight, in which caſe they make ſuch a reſiſtance, that the tail is broken without bringing out the body. In order, therefore to take them without mutilation, the burrow muſt be opened.

When they find themſelves in the hand of the purſuers, they roll themſelves up into a ball; and are placed near the fire, to force them to ſtretch out their coat of mail; which, hard as it is, as ſoon as it is touched with the finger, the animal receives ſo quick an impreſſion, that he contracts in an inſtant. When they are in deep burrows, the method of forcing them out is to ſmoke them, or to let water run down the hole. Some pretend, that they remain under ground above three months without venturing out It is true, that they remain in their holes in the day time, and never go out but in the night to ſeek for their ſubſiſtence. The armadillo is hunted with ſmall dogs, that ſoon overtake him; but he ſtops before they have reached him, and contracts himſelf; in which condition he is carried off. If he finds himſelf on the brink of a precipice, he eſcapes the dogs and the huntſmen, by rolling himſelf up, and falling down like a ball without injury or prejudice to his ſcales.

Theſe animals are fat, and very prolific. The female brings forth, as it is reported, four young ones every month, which makes their ſpecies very numerous. They are good to eat, and are eaſily taken with ſnares laid for them on the banks of rivers, and in the marſhy grounds, which they prefer to every other place. It is pretended, that they are not afraid of the bite of the rattle-ſnake, and that they live in peace with theſe reptiles, which are often found in their holes. The ſavages make baſhets, boxes, and other ſmall veſſels of their ſcales.

The Paca, or Spotted Cavy.

The Paca, or Spotted Cavy, is an animal of the New World, who digs a burrow like a rabbit, to which he has been compared, though there is ſcarcely any likeneſs between them. He is much larger than the rabbit, and even than the hare; he has a round head, and a ſhort ſnout; he is fat and bulky, and, by the form of his body, he is more like a pig, in grunting, waddling, and the manner of eating; for he grubs up the earth like the hog, to find his ſubſiſtence. Theſe animals inhabit the banks of rivers, and are found in damp and hot places of South America. Their fleſh is very good to eat, and exceſſively fat. Their ſkin is eaten like that of a pig, for which reaſon a perpetual war is carried on againſt theſe animals. Huntſmen find it very difficult to take them alive; and when they are ſurpriſed in their burrows, which have two openings, they defend themſelves with great obſtinacy and bite with exceſſive fury. Their ſkin, though covered with ſhort and rough hair, is valuable becauſe it is ſpotted on the ſides. Theſe animals bring forth young in abundance. Men and animals of prey deſtroy a great quantity of them, and yet the ſpecies is ſtill numerous. They are peculiar to South America, and are not to be met with in the Old Continent.

The Opoſſum.

The Opoſſum is an animal of America, which is eaſily diſtinguiſhed from all others by two ſingular characters. The firſt is, that the female has under the belly a large cavity, where ſhe receives, and ſuckles her young. The ſecond is, that the male and the female have no claws on the great toe of the hind feet, which are ſeparated from the others, as the thumb in the hand of a man, whilſt the other toes are armed with crooked claws, as in the feet of other quadrupeds.

The opoſſum is only found in the ſouth parts of the New World; but it does not conſtantly dwell in the hotteſt climates. It is found not only in Braſil, Guiana, and Mexico, but alſo in Florida, Virginia, and other temperate regions of this continent. It produces often, and a great number of young each time. Moſt authors ſay, four or five young; others, ſix or ſeven. Marcgrave affirms, that he has ſeen ſix young living in the bag of the female; they were about two inches long, they were already very nimble, they went in and out of the bag many times in a day; they are ſtill ſmall when they are juſt brought forth. Some travellers ſay, that they are not larger than flies when they go out of the womb into the bag, and ſtick to the paps. This fact is not ſo much exaggerated as ſome may imagine, for we have ſeen in an animals, whoſe ſpecies is like that of the opoſſum, young ones ſticking to the paps no larger than a bean. Hence we may preſume, that in theſe animals the womb is only the place of conception, of the formation, and of the firſt unfolding of the fœtus, which increaſes in the bag.

The young opoſſums ſtick to the paps of the dam till they have acquired ſtrength enough to move eaſily. This is a well authenticated fact, nor is it peculiar to this ſpecies only. Some authors pretend, that they ſtick to the paps for ſeveral weeks; others ſay, that they remain in the bag only the firſt month after they proceed from the womb. One may eaſily open this bag, obſerve, count, and even feel the young without diſturbing them. They will not leave the pap, which they hold with their mouth, but when they are ſtrong enough to walk; then they fall into the bag, and go out, and ſeek for their ſubſiſtence. They go in again to ſleep, to ſuckle, and to hide themſelves when they are terrified. When the mother flies, and carries in it the young, her belly does not ſeem bigger when ſhe breeds than uſual, for in the time of the true geſtation, one can ſcarce perceive her to be pregnant.

From the mere inſpection of the form of the feet of this animal, it is eaſy to judge, that it walks awkwardly, and ſeldom runs. One walking moderately may eaſily outſtrip it. It climbs up trees with great facility, hides itſelf in the leaves to catch birds, or hangs itſelf by the tail, the extremity of which is muſcular, and flexible as the hands, ſo that it may ſqueeze, and even incurvate all the bodies it ſeizes upon. It ſometimes remains a long time quiet in this ſituation. Its body hangs with the head downward, when it ſilently waits for its prey. At other times, it balances itſelf to jump from one tree to another like the monkeys which it reſembles both in having a large and flexible tail, and in the conformation of its feet. Though it be voracious, and even greedy of blood, which it ſucks with avidity, it feeds alſo upon reptiles, inſects, ſugar-canes, potatoes, roots, and even leaves and bark of trees. It may be fed as a domeſtic animal. It is neither wild nor ferocious. It is eaſily tamed, but its nauſeous ſmell is more offenſive than that of the fox. Its figure is alſo forbidding; for independently of its ears, which reſemble thoſe of an owl, of its tail, which reſembles that of a ſerpent, and of its mouth, which is cleft to the very eyes, its body appears always very dirty, becauſe its hair is neither ſmooth nor curled, but tarniſhed, as if covered with dirt. The bad ſmell of this animal reſides in the ſkin, for its fleſh is palatable. The ſavages hunt this animal, and feaſt on its fleſh with avidity.

The

The Marmoſe, or Murine Opoſſum.

The marmoſe, or murine oppoſſum reſembles in moſt reſpects the latter ſpecies. They are natives of the ſame climate, in the ſame continent, and are very much alike by the form of the body, the conformation of the feet, and the tail, a part of which is covered with ſcales, the upper part only being hairy. But the marmoſe is ſmaller than the common opoſſum, his ſnout is ſtill ſharper; the female has no bag under the belly, ſhe has only two looſe ſkins near the thighs, between which the young ſtick to the paps. When the young are brought forth, they are not ſo large as ſmall beans. The brood of the marmoſe is very numerous; we have ſeen ten ſmall marmoſes, each ſticking to a pap, and the dam had ſtill four paps unoccupied. I am perſuaded, that theſe animals bring forth a few days after the conception. The young are then fœtus only, which are not come to the fourth part of their growth. The dam always miſcarries, and the fœtuſes ſave their lives in ſticking to the paps, without leaving them till they have acquired the growth and ſtrength which they would naturally get in the womb.

The Cayopollin, or Mexican Opoſſum.

The cayopollin, or Mexican opoſſum according to Fernandes is a ſmall animal, little larger than a rat, very much reſembling the opoſſum in the ſnout, the ears, and the tail, which is thicker and ſtronger than that of a rat. He makes uſe of it, as we do of our hands. He has thin tranſparent ears. His belly, legs, and feet, are white. The young, when they are frightened, embrace the mother, who lifts them up on the trees. This ſpecies has been found on the mountains of New Spain.

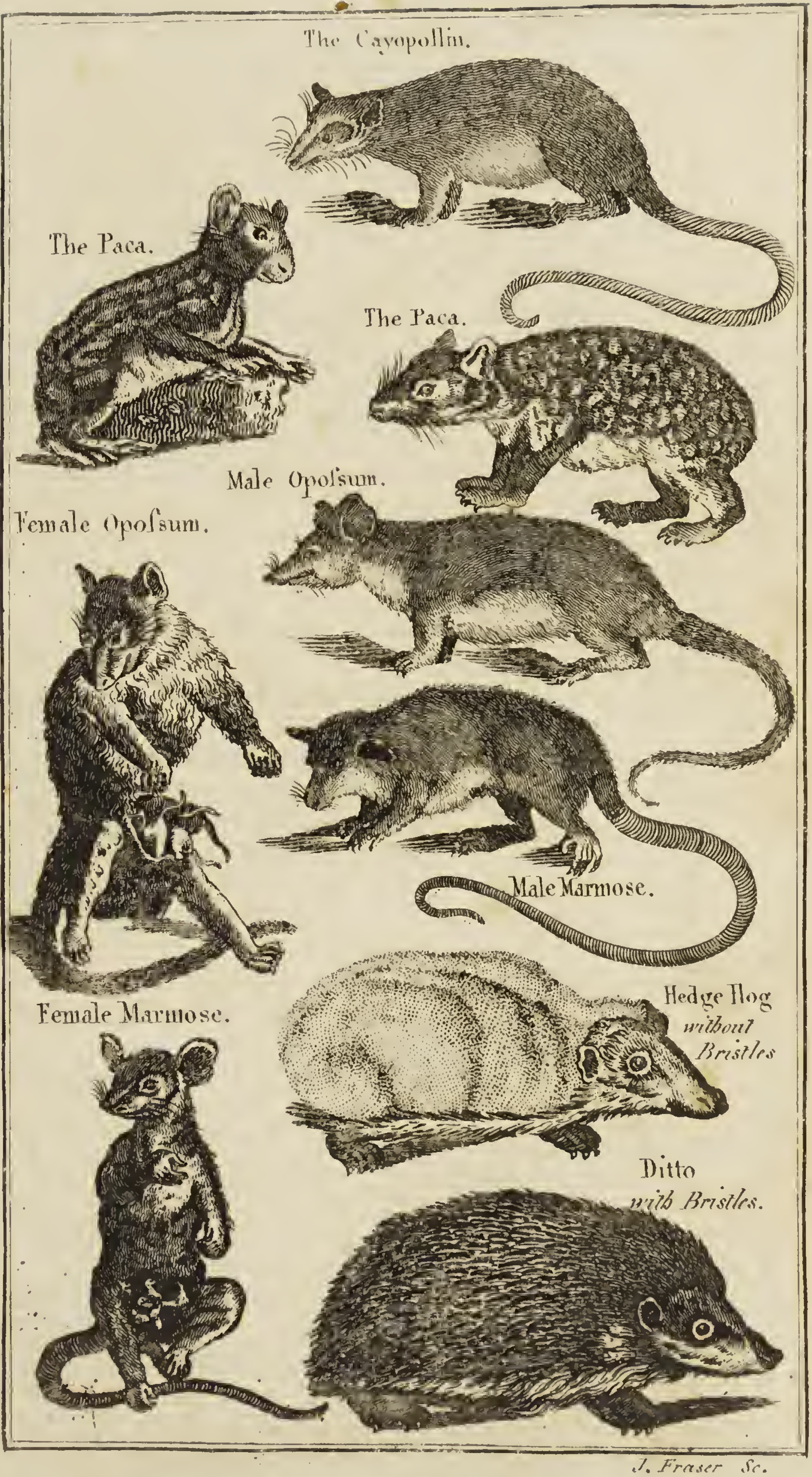
C H A P. XVI.

OF THE ELEPHANT—THE RHINOCEROS—THE CAMEL AND DROMEDARY—THE BUFFALO, THE URUS, THE BISON, AND THE ZEBU.

The Elephant.

THE human race excepted, the elephant is the moſt reſpectable of animals. In ſize he ſurpaſſes all other terreſtrial creatures, and in underſtanding is only inferior to man. Of all the brute creation, the elephant, the dog, the ape, and the beaver are moſt admirable for ſagacity; but the genius of the dog is only borrowed, being inſtructed by man in almoſt every thing he knows. The monkey has only the appearance of wiſdom, and the beaver is only ſenſible with regard to himſelf, and his ſpecies. The elephant is ſuperior to them all three: he unites all their moſt eminent qualities. The hand is the principal organ of the monkey's dexterity. The elephant with his trunk, which ſerves him inſtead of arms and hands, with which he can lift up, and ſeize the ſmalleſt, as well as the largeſt objects, carry them to his mouth, place them on his back, hold them, or throw them far off, has the dexterity of the monkey, and the tractableneſs of the dog. He is like the latter ſuſceptible of gratitude, and capable of a ſtrong attachment.

Plate II.


The Cayopollin.
The Paca.
The Paca.
Male Opoſsum.
Female Opoſsum.
Male Marmose.
Female Marmose.
Hedge Hog
without
Bristles
Ditto
with Bristles.

J. Fraser Sc.

He uſes himſelf to man without reluctance, and ſubmits to him, not ſo much by force, as good treatment. He ſerves him with zeal, intelligence, and fidelity: in fine, the elephant, like the beaver, loves the ſociety of his equals, and renders himſelf agreeable to them. They are often ſeen to aſſemble together, to diſperſe, and to act in concert. If they do not erect buildings, and do not work in common, it is, perhaps, for want of room only, and tranquillity; for men in the earlieſt periods multiplied in all the regions inhabited by the elephant. Hence he conſequently lives in fear and anxiety, and can no where find a ſpace large and ſecure enough to eſtabliſh his habitation on a ſettled ſpot. Every being in nature has his real price, and relative value. In order to judge of both in the elephant, we muſt allow him at leaſt the judgement of the beaver, the dexterity of the monkey, the ſentiment of the dog, and the peculiar advantages of ſtrength, ſize, and longevity. We muſt not forget his arms, or his defence, with which he can pierce through, and conquer the lion. He ſhakes the ground at every ſtep: with his trunk he eradicates trees: with the ſtrength of his body he makes a breach in a wall: terrible by his force, he is invincible by the reſiſtance only of his enormous maſs, and by the the thickneſs of the leather which covers it. On his back he carries a tower replete with armed hoſts. He alone drags machines, which ſix horſes cannot move. To this prodigious ſtrength he joins courage, prudence, coolneſs, and an exact obedience. He preſerves moderation even in his moſt violent paſſions: he is more conſtant than impetuous in love: in anger he does not forget his friends: he never attacks any but thoſe who have given offence: he remembers favours as long as injuries: feeding chiefly upon vegetables, he is not naturally an enemy to other animals. Hence he is an univerſal favourite. The ancients conſidered the elephant as a prodigy of nature; they exaggerated his natural faculties; and they attributed to him, not only intellectual qualities, but moral virtues.

In a wild ſtate, the elephant is neither bloody nor ferocious; his manners are ſocial, and he ſeldom wanders alone. The oldeſt leads the herd, the next in age drives them, and forms the rear: the young and the weak are in the middle. The females carry their young, and hold them cloſe with their trunks. They only obſerve this order, however, in perilous marches, when they go to feed on cultivated lands. In foreſts and ſolitary places they are cautious, but ſtill keeping at ſuch a moderate diſtance from each other, as to be able to give mutual aſſiſtance, and ſeaſonable warning in caſe of danger. Some, however, ſtraggle, and remain behind the reſt; which alone are attacked by the huntſmen, for it would take an army to conquer a whole herd. It is even dangerous to do them the leaſt injury, they go ſtrait to the offender; and notwithſtanding the weight of their body, they walk ſo faſt that they eaſily overtake the lighteſt man in running. They pierce him through with their tuſks, or ſeize him with their trunks; throw him againſt a ſtone, and tread him under their feet; but it is only when they have been provoked, that they become ſo furious and implacable. It is ſaid, that when they have been once attacked by men, or have fallen into a ſnare, they never forget it, and ſeek for revenge on all occaſions. As they have perhaps a more exquiſite ſenſe of ſmelling than any other animal, owing to the large extent of their noſe, they ſmell a man at a great diſtance, and can eaſily follow him by the tract. Theſe animals are fond of the banks of rivers, deep valleys, ſhady places, and marſhy grounds; they cannot ſubſiſt long without water, and make it thick and muddy before they drink. They often fill their trunks with it, either to convey it to their mouth, or only to cool their noſe, and to amuſe themſelves in ſprinkling it around them. They cannot ſupport cold, and they ſuffer equally from exceſſive heat, for to avoid the burning rays of the ſun, they penetrate into the thickeſt foreſts: they alſo bathe often in the water; and the enormous ſize of their body is rather an advantage to them in ſwimming. Beſides, the length of their trunk, which they erect, and through which they breathe, prevents their being drowned.

Their common food is roots, herbs, leaves, and young branches; they alſo eat fruit and corn, but they diſlike fleſh and fiſh. When one of them finds good paſture, he has the generoſity to invite the reſt to participate with him. As they need a great quantity of fodder, they often change their place, and when they find cultivated lands, they make prodigious havock. Their bodies being of an enormous weight, they deſtroy ten times more with their feet, than they conſume for their food, which may be reckoned at the rate of one hundred and fifty pounds of graſs every day. As they never feed but in great numbers, they conſume a large territory in about an hour's time. The Indians and the Negroes therefore, ever attentive to their property, have recourſe to every expedient in order to expel them from their territories. This ſagacious animal on the other hand, no leſs intent upon its prey, is generally ſucceſsful in carrying off its booty. It is difficult to frighten them, as they are ſcarce ſuſceptible of fear. Nothing can ſtop them but fire works, and crackers thrown amongſt them, the ſudden effect of which, often repeated, forces them ſometimes to retreat. It is very difficult to part them, for they commonly attack their enemies all together, proceed unconcerned, or turn back.

The female elephant goes two years with young; during which the male never copulates with her. They only bring forth a young one, which has teeth as ſoon as brought forth, and is then larger than a boar; yet his tuſks are not viſible, they appear ſoon after, and at ſix months old, are ſome inches long. At that age, the elephant is larger than an ox, and the tuſks continue to increaſe till he is advanced in years.

It is very eaſy to tame the elephant. As he is the ſtrongeſt and moſt rational, he is the moſt uſeful of animals; but he ſeems to be ſenſible of his ſervile condition, for he never generates in a domeſtic ſtate.

There is no domeſtic elephant but has been wild before, and the manner of taking, taming, and ſubjecting them, deſerves particular attention. In the middle of foreſts, and in the vicinity of the places which they frequent, they chuſe a large ſpace which they encircle with palliſadoes. The ſtrongeſt trees of the foreſt ſerve inſtead of ſtakes, to which they faſten croſs pieces of timber, which ſupport the other ſtakes. A man may eaſily paſs through this palliſado. There is another great opening, through which the elephant may enter, with a trap hanging over it, or a gate which is ſhut behind him. To bring them to that incloſure, he muſt be enticed by a tame female in rut; and when her leader thinks ſhe is near enough to be heard, he obliges her to indicate by her cries, the condition ſhe is in. The wild male anſwers immediately,

ately, and begins his march to join her. She repeats her call now and then, and arrives firſt to the firſt incloſure, where the male following her track, enters through the ſame gate. As ſoon as he perceives himſelf ſhut up, his ardour vaniſhes, and when he diſcovers the huntſmen, he becomes furious. They then entrap him with ropes; they fetter his legs and his trunk, they bring two or three tame elephants, and try to tie them with the wild one, and at laſt, by dint of dexterity, ſtrength, terror, and careſſes, in a few days they render him tame.

The elephant once tamed, becomes the moſt tractable and the moſt ſubmiſſive of all animals. He conceives an affection for his leader, he careſſes him, and ſeems to gueſs whatever can pleaſe him. In a little time he underſtands the ſigns, and even the expreſſion of ſounds. He diſtinguiſhes the tone of command, that of anger or good-nature, and acts accordingly: he never miſtakes the words of his maſter: he receives his orders with attention, executes them with prudence and eagerneſs, without precipitation; for his motions are always meaſured, and his character ſeems to participate of the gravity of his body. He is eaſily taught to bend the knee to aſſiſt thoſe who will ride on his back. He careſſes his friends with his trunk, and ſalutes with it the perſons he is directed to take notice of. He makes uſe of it to lift burdens, and helps to load himſelf. He has no averſion at being clothed, and ſeems to delight in a golden harneſs or magnificent trappings. He is eaſily put to the traces of carts, and draws ſhips upon occaſion. He draws evenly, without ſtopping, or any marks of diſlike, provided he is not inſulted by unſeaſonable correction, and that his driver ſeems to be thankful for the ſpontaneous exertion of his ſtrength. His leader is mounted on his neck, and makes uſe of an iron rod crooked at an end, with which he ſtrikes him gently on the head to make him turn or increaſe his pace; but often a word is ſufficient, eſpecially, if he has had time to make himſelf well acquainted with his leader, and has a confidence in him. His attachment is ſometimes ſo ſtrong, and ſo laſting, and his affection ſo great, that he generally refuſes to ſerve under any other perſon, and he is known to have died of grief for having killed his governor.

The ſpecies of the elephant is numerous, though they bring forth but one young once in two or three years. The ſhorter the life of animals, is, the more they multiply. In the elephant, the length of his life compenſates the ſmall number; and if it is true, as has been affirmed, that he lives two hundred years, and that he begets when he is one hundred and twenty years old, each couple brings forth forty young in that time. Beſides, having nothing to fear from other animals, and little even from men, who take them with great difficulty, the ſpecies has not decreaſed, and is generally diſperſed in all the ſouthern parts of Africa and Aſia.

From time immemorial the Indians made uſe of elephants in war. Amongſt thoſe nations unacquainted with the European military diſcipline, they were the beſt troop of their armies; and while battles were decided by mere weapons, they generally obtained the victory. We find however that the Greeks and Romans had the addreſs to vanquiſh thoſe monſters of war. They opened their ranks to let them go through; and did not attempt to wound them, but ſhowered their darts againſt their leaders, who were forced to ſurrender, and to calm the

elephants

elephants when ſeparated from their troops. But now that fire is become the element of war, and the principal inſtrument of death, the elephants, who are afraid of the noiſe and the fire of the artillery, would be an incumbrance in battle, and more dangerous than uſeful.

In thoſe happy regions, however, where our fatal inſtruments are ſcarcely known, they ſtill bring elephants to the field. At Cochin, and in the other parts of Malabar, they do not make uſe of horſes, and all who do not fight on foot are mounted on elephants. In Tonquin, Siam, and Pegu, the king, and all the grandees, never ride but upon elephants. On feſtival days they are preceded and followed by a great number of theſe animals covered with the richeſt ſtuffs. On comparing the relations of travellers and hiſtorians, it appears that in the former quarter of the globe, they are not ſo wild as in the eaſtern, and often with an impatient air, they venture to approach the abodes of men.

In general, however, the elephants of Aſia are larger and ſtronger than thoſe of Africa, particularly thoſe of Ceylon, who exceed in courage and ſagacity all thoſe of Aſia. Probably they owe theſe qualifications to their education, more improved in Ceylon than any where elſe. The elephants of the Indies eaſily carry burdens of three or four thouſand weight. The ſmalleſt, that is, thoſe of Africa, lift up freely with their trunks burdens of two hundred pounds weight, and place them on their ſhoulders. They take in this trunk a great quantity of water, which they throw out around them, at ſeven or eight feet diſtance. They can carry burdens of more than a thouſand weight upon their tuſks: with their trunk they break branches of trees, and with their tuſks they root out the trees. One may judge of their ſtrength by their agility, conſidering at the ſame time the bulk of their body. They walk as faſt as a ſmall horſe on the trot, and when they run, they can keep up with a horſe on full gallop, which ſeldom happens in their wild ſtate, except when they are provoked by anger, or frightened. The tame elephants travel fifteen or twenty leagues a day without being fatigued; and when they are hurried, they may travel thirty-five or forty leagues. They are heard at a great diſtance, and may eaſily be followed by the evident traces which their feet leave upon the ground, and which are fifteen or eighteen inches diameter.

When the elephant is taken care of, he lives a long time in captivity. According to ſome he lives four or five hundred years. Others, again mention two or three hundred; the moſt credible, one hundred and twenty, thirty, and even one hundred and fifty years. I take this laſt opinion to be the neareſt to truth; whatever care, however, is taken of the elephant, he does not live long in temperate countries, and ſtill ſhorter in cold climates. The elephant which the king of Portugal ſent to Louis XIV. in 1668, and which was then but four years old, died in his ſeventeenth, in January 1681, and lived only thirteen years in the menagerie of Verſailles, where he was treated with care and tenderneſs, and fed with profuſion. He had every day four pounds of bread, twelve pints of wine, two buckets of porridge, with four or five pounds of bread, two buckets of rice boiled in water, without reckoning what was given to him by viſitors. He had, beſides, every day one ſheaf of corn to amuſe himſelf with; for, after he had eaten the corn ears, he made a kind of whip of ſtraw, and uſed it to drive away the flies. He delighted in breaking the ſtraw in ſmallbits, which he did with great dexterity with his trunk; and, as he was led forth to walk every day in the fields he devoured graſs.

The common colour of the elephant is aſh-grey, or blackiſh. White ones are extremely ſcarce; ſome have been ſeen at different times in the Indies, where there are alſo ſome of a reddiſh colour.

The elephant has very ſmall eyes, comparatively with his enormous ſize, but they are ſenſible and lively; and what diſtinguiſhes them from thoſe of every other animal, is, their pathetic ſentimental expreſſion. He ſeems to reflect, to think, and to deliberate; and never acts till he has examined and obſerved ſeveral times, without paſſion or precipitation, the ſigns which he is to obſerve. Dogs, whoſe eyes have much expreſſion, are animals too lively to diſtinguiſh their ſucceſſive ſenſations; but as the elephant is naturally grave and ſedate, one may read in his eyes his interior affections.

He has a quick hearing, and this organ is outwardly like that of ſmelling, more marked in the elephant than in any other animals. His ears are very large, even in proportion to his body: they are flat, and cloſe to the head, like thoſe of a man: they commonly hang down, but he raiſes them up, and moves them with great eaſe: he makes uſe of them to wipe his eyes, and to cover them againſt the inconveniency of flies and duſt. He delights in the ſound of inſtruments, and ſeems to like muſic: he ſoon learns to beat time, and to move accordingly. He ſeems animated by the beat of the drum, and the ſound of trumpets: he has an exquiſite ſmell, and is paſſionately fond of perfumes of all ſorts, and of fragrant flowers, which he firſt uſes for noſe-gays, and then conveys them to his mouth as if about to taſte them.

His ſenſe of feeling centers in his trunk, which being compoſed of membranes, nerves, and muſcles, is an organ of ſenſe: and which he can not only move and bend, but which he can ſhorten, lengthen, and turn any way. The extremity of this trunk terminates by an edge, which projects above like a finger, with which he picks up the ſmalleſt pieces of money from the ground, gathers nuts and flowers, unties knots, opens and ſhuts doors, by turning the keys, and draws regular characters with an inſtrument as ſmall as a pen.

Although the elephant has a more retentive memory, and more intelligence than any other animal, he has a ſmaller brain than moſt of them. He is, at the ſame time, a miracle of intelligence, and a monſter of matter. His body is very thick, without any ſupplenefs. His neck is ſhort, and very ſtiff: his head is ſmall and deformed: his ears are of an exceſſive diameter; and his noſe is of a ſtill more diſproportionate length: his eyes are too ſmall, as well as his mouth: his legs are like maſſive pillars, ſtrait and ſtiff: his feet are ſo ſhort and ſo ſmall, that he ſeems to have none; his ſkin is hard, thick, and callous. All theſe deformities are remarkable, as all of them are exhibited in large; and they are more diſagreeable to the eye, as moſt of them are unparalelled in the creation; no other animal having either the head, the feet, the noſe, the ears, or the tuſks, like thoſe of the elephant.

The elephant is alſo ſingular in the conformation of the feet, and the texture of the ſkin. He has very little hair on his body, but a conſiderable deal on the eye-lids, on the back part of the head, within the ears, and on the thighs and the legs. The epidermis, or outſide ſkin, hard and callous, has two ſorts of wrinkles, ſome hollow, others prominent. In man, and other animals, the epidermis ſticks every where cloſe to the ſkin. In the elephant, it is only faſtened by ſome points, like two quilted ſtuffs one above the other. This epidermis is naturally dry and ſoon acquires three or four lines of thickneſs, by the cruſts which are generated one above the other drying up. It is this thickneſs of the epidermis which produces the *elephantiaſis*, or dry leproſy, to which man, whoſe ſkin is bare, like that of the elephant, is ſometimes ſubject. This diſtemper is very common to elephants; and, to prevent it, the Indians take care to rub them often with oil, and to preſerve the ſkin ſupple by frequent bathing. It is rather tender where it is not callous; and the elephant is ſo fearful of the ſting of the flies, that he not only employs his natural motions, but even the reſources of his intelligence, to get rid of them. He makes uſe of his tail, of his ears, of his trunk, to ſtrike them. He likewiſe contracts his ſkin wherever he can, and ſqueezes them to death betwixt his wrinkles. He cleans his ſkin by rubbing it with pumice ſtones, and then pours perfumed oil and colours upon it. The conformation of the feet and legs is alſo ſingular, and different in the elephant from that of other animals. The fore legs ſeem to be higher than thoſe behind, yet the hind legs are the longeſt. They are not bent like the hind legs of a horſe, or an ox, the thighs of which ſeem to be of the ſame piece with the buttocks. Their knee is very near the belly, and the foot is ſo high, and ſo long, that it ſeems to make a great part of the leg. In the elephant, on the contrary, this part is very ſhort, and touches the ground; he has the knee, like man, in the middle of the leg, not near the belly. This ſhort and ſmall foot, is divided into five toes, which are all covered with a ſkin; but one ſees only a ſort of claws, the number of which varies, though that of the toes is conſtant; for he has always five to each foot, and for the moſt part five claws; but ſometimes he has no more than four, or even three; and, in this caſe, they do not correſpond exactly with the extremity of the fingers.

The elephant's tail is hardly ſo long as either of his ears. Each of them is near three feet long, and is rather thin, ſharp, and garniſhed at the extremity with a tuft of large, black, ſhining, and ſolid briſtles, which are as ſtrong as wire; and a man cannot break them with his hand, though they are elaſtic and pliant. This tuft of hair is an ornament which the Negro women are particularly fond of; and they attribute to it ſome particular virtue, according to their ſuperſtitious notions. Hence an elephant's tail is ſometimes ſold for two or three ſlaves; and the Negroes often riſk their lives to ſnatch it from the living animal.

The largeſt elephants of the Indies, and the eaſtern coaſts of Africa, are fourteen feet high; the ſmalleſt, which are found in Senegal, and in the other weſtern parts of Africa, are not above ten or eleven feet; and thoſe which have been brought young into Europe, were not ſo high. The elephant at the menagerie of Verſailles, which came from Congo, was but ſeven feet and a half high in his ſeventeenth year. During thirteen years that he lived in France, he did not grow above a foot; ſo that, at the age of four, when he was ſent, he was only ſix feet and a half high. Theſe enormous animals ſcour along with great ſpeed; they are ſupported by four members, which are more like pillars, or maſſive columns, from fifteen to eighteen inches in diameter, and five or ſix feet high. Thus, the elephant, with one ſtep to a man's two, will overtake him in running.

In order to give a complete idea of the nature and intelligence of this animal, we ſhall inſert here ſome particulars communicated to us by the Marquis of Montmirail. The Indians make uſe of the elephant to carry artillery over mountains; and it is then, that he gives the greateſt proofs of his intelligence. He acts in the following manner:—When the oxen, yoked two and two, endeavour to draw the piece of artillery up the mountain, the elephant puſhes the breach of the gun with his forehead; and ſupports the carriage with his knee, which he places near the wheel. When his leader employs him in ſome hard labour he explains his work, and the reaſons that ſhould induce him to comply. If the elephant ſhews an averſion to comply, the *cornca* (ſo his leader is called) promiſes to give him arrack, or ſomething he likes. Upon this the animal agrees to every thing propoſed; but it is dangerous for the *cornca* to forfeit his word. An inſtance of this happened in the Deckan, which deſerves to be recorded; and, however incredible it may appear, is perfectly true. An elephant had been revenged of his cornca in killing him. His wife, witneſs of this cataſtrophe, took her two children, and threw them to the feet of the animal, ſtill furious; telling him, *Since thou haſt killed my huſband, take my life, and that of my children.* The elephant ſtopped ſhort, grew calm, and, as if he had been moved with regret and compaſſion, took with his trunk the largeſt of the two children, placed it on his neck, adopted him for his cornca, and would have no other leader.

If the elephant is vindictive, he is no leſs grateful. A ſoldier of Pondicherry, who commonly carried to one of theſe a certain meaſure of arrack every time that he received his pay, having one day taken a glaſs too much, and ſeeing himſelf purſued by the guard, who threatened to conduct him to priſon, took refuge under the elephant, and ſlept there. It was in vain, that the guard attempted to draw him out from the aſylum; the elephant defended him with his trunk. Next day the ſoldier having become ſober, was ſtruck with terror to lie under an animal of this enormous bulk. The elephant, who, no doubt, perceived his conſternation, careſſed him with his trunk, to remove his fears, and treated him with the greateſt tenderneſs.

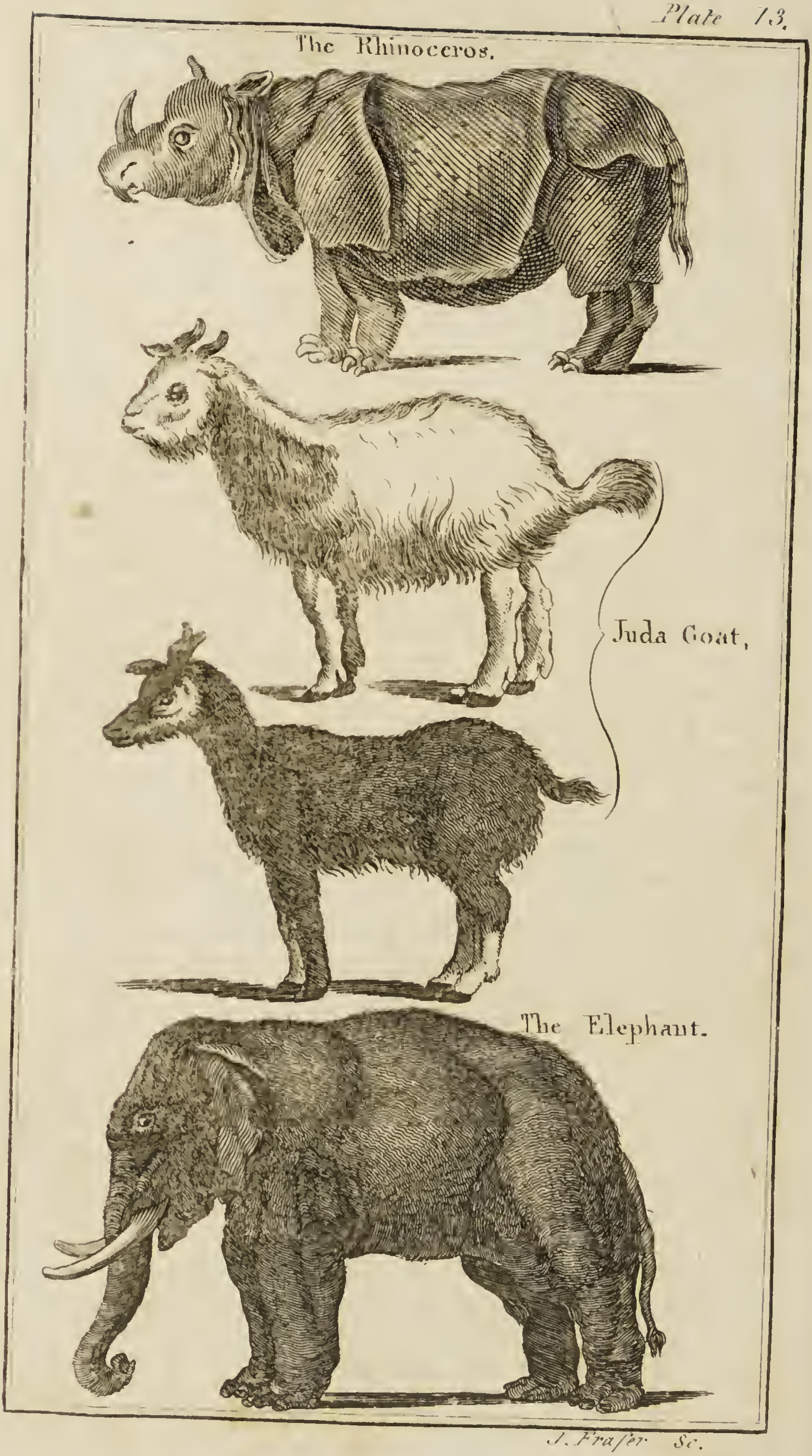
The elephant falls ſometimes into a ſort of frenzy, which deprives him of his tractableneſs, and makes him even formidable. He is commonly killed on the firſt ſymptoms of madneſs, for fear of miſchief. Sometimes he is confined in heavy chains, but when he is in his natural ſtate, the moſt acute pain cannot make him injure one who has not offended him. An elephant, furious with the wounds which he had received in battle at Hambour, ran through the fields, and ſhrieked in a moſt hideous manner. A ſoldier, who, notwithſtanding the warning of his companions, could not fly, perhaps, becauſe he was wounded, remained in the way. The elephant moved with a generous compaſſion, took him with his trunk, placed him gently on one ſide of the road, and continued his march. The gentlemen of the Academy of Sciences have alſo communicated to us ſome facts which they had learned from thoſe who managed the elephant at the menagerie of Verſailles; which it may not be improper to take notice of. "The elephant ſeemed to diſcern when any perſon inſulted him; and he remembered to be revenged the firſt opportunity. Having been baulked by a man, who feigned to throw ſomething into his mouth, he ſtruck him with his trunk, and broke two of his ribs. Afterwards he trampled him under his feet, and broke one of his legs; and, having kneeled down, he tried to thruſt his tuſks into the man's belly, which, however, went into the ground on both ſides of the thigh, which was not wounded. He bruiſed another man, by ſqueezing him againſt the wall, for a ſimilar mockery. A painter was deſirous to draw him in an extraordinary attitude, which was, to keep his trunk erect, and his mouth open. The ſervant of the painter, to make him remain in that attitude, threw fruits into his mouth; but after he deceived him, and as if he had been privy to the whole matter, he was revenged on the painter himſelf by diſcharging a great deal of water from his trunk, which damnified the paper intended for the portrait."

He made leſs uſe of his ſtrength than of his dexterity, which was ſuch, that he untied, with great facility, a double leather ſtring which faſtened his leg, with his mouth, untying it from the buckle's tongue, and after this buckle had a ſmall ſtring twiſted around it, with ſeveral knots, he untied them all, without breaking any thing. One night, that he had thus diſentangled himſelf from his leather ſtrings, he broke open ſo dexterouſly the door of his lodge, that his governor was not awaked by the noiſe. He went thence into divers yards of the menagerie. breaking open the doors that were ſhut, and pulling down the ſtonework, when the paſſage was too narrow for him. After this, he went into the lodges of other animals, terrifying them to ſuch a degree, that they fled to the remoteſt parts of the park for an aſylum. In ſhort, to omit nothing of what may contribute to make all the natural faculties of this animal perfectly known, as well as his acquired knowledge, we ſhall add ſome facts, extracted from the moſt credible authors.

Of five elephants (ſays Tavernier), which huntſmen had taken, three eſcaped, although their bodies and their legs were faſtened with chains and ropes. Theſe men told us a very ſurpriſing circumſtance, if we can believe it, which is, that when once theſe elephants have been caught, and eluded the ſnares of their adverſaries, if they are forced to ſeek refuge in the woods, they are diffident, and break with their trunk a large branch, with which they ſound the ground before they put their foot upon it, in order to diſcover if there be holes in their paſſage. This circumſtance made the huntſmen deſpair of catching the three elephants that had eſcaped. We ſaw the other two which they had caught; each of them was betwixt two tame elephants; and around the wild elephants were ſix men, holding ſpears. They ſpoke to theſe animals in preſenting them ſomething to eat, and telling them, in their language, *Take this, and eat it.* They had ſmall bundles of hay, bits of black ſugar, or rice boiled in water, with pepper. When the wild elephant refuſed to do what he was ordered, the men commanded the tame elephants to beat him, which they did immediately. and if the poor creature ſeemed to retaliate, another ſtruck him; ſo that he was compelled to obey.

I have obſerved ſeveral times (ſays Edward Terry), that the elephant does many things which are rather an indication of reaſon, than of ſimple inſtinct. He does whatever his maſter commands him. If he orders him to frighten any perſon, he advances towards him with the

Plate 13.


The Rhinoceros.
Juda Goat,
The Elephant.

J. Fraser Sc.

the ſame fury as if he would tear him to pieces: and when he comes near him, he ſtops ſhort, and does him no harm. If his maſter wiſhes to affront him, he has only to ſignify it to the elephant, who takes with his trunk dirty water and throws it at his face. The Mogul has elephants for the execution of criminals condemned to death. If their leader bids them diſpatch theſe wretches ſoon, they tear them to pieces in a moment with their feet. But if he command them to make theſe criminals languiſh, they break their bones one after another, and make them ſuffer torments as cruel as thoſe of the wheel.

The Rhinoceros.

Next to the elephant, the rhinoceros is the moſt powerful of all quadrupeds. He is at leaſt twelve feet long, from the extremity of the ſnout to the tail; ſix or ſeven feet high; and the circumference of his body is nearly equal to his length. He is therefore like the elephant in bulk; and if he appears much ſmaller, it is becauſe his legs are much ſhorter in proportion to thoſe of the elephant; but he differs widely from that ſagacious animal, in his natural faculties, and his intelligence. Deprived of all feeling in the ſkin, having no organ anſwering the purpoſe of hands, nor diſtinct for the ſenſe of feeling; he has nothing inſtead of a trunk, but a moveable lip, to which all his dexterity is confined. He is ſuperior to other animals only in ſtrength, ſize, and the offenſive weapon which he carries upon his noſe, and which is peculiar to him. This weapon is a very hard horn, ſolid throughout, and placed more advantageouſly than the horns of ruminating animals, which only protect the ſuperior parts of the head and neck, whilſt the horn of the rhinoceros defends all the exterior parts of the ſnout, and preſerves the muzzle, the mouth, and the face from inſult. Hence the tiger cannot attack him in front, without running the riſk of being devoured. As his body and limbs are covered with an impenetrable ſkin, he diſregards the claws of the tiger and the lion no leſs than the weapons of the huntſman. His ſkin is a dark leather, of the ſame colour, but thicker and harder than that of the elephant: he does not feel the ſting of flies: he cannot contract his ſkin: it is only folded by large wrinkles on the neck, the ſhoulders, and the buttocks, to facilitate the motions of the head and the legs, which terminate in large feet, armed with three great claws. He has the head larger in proportion than the elephant; but his eyes are ſmaller, which never opens entirely. The upper jaw projects above the lower; and the upper lip has a motion, and may be lengthened ſix or ſeven inches. It is terminated by a ſharp edge, which enables this animal, with more facility than other quadrupeds, to gather the graſs, and divide it into handfuls, as the elephant does with his trunk. This muſcular and flexible lip is a ſort of trunk very incomplete, but which is equally calculated for ſtrength and dexterity. Inſtead of thoſe long ivory teeth which form the tuſks of the elephant, the rhinoceros has his powerful horn and two ſtrong inciſive teeth in each jaw. Theſe inciſive teeth, which the elephant has not, are placed at a great diſtance from each other in the jaws of the rhinoceros. He has, beſides theſe, twenty-four ſmaller teeth, ſix on either ſide of each jaw. His ears are always erect; and in form are like thoſe of a hog, only they are larger in proportion to his body, of which they are the only hairy parts. The end of the tail is, like that of the elephant, furniſhed with a tuft of large briſtles, which are very hard and ſolid.

The rhinoceros which arrived in London in 1739, had been ſent from Bengal. Although he was young (being but two years old), the expences of his food, which conſiſted of rice, ſugar, and hay, and his voyage, amounted to near one thouſand pounds ſterling. They gave him every day ſeven pounds of rice mixed with three pounds of ſugar; which they divided into three parts. He had alſo a great quantity of hay and green graſs, which he preferred. His drink was nothing but water, of which he drank a great quantity at once. He was of a quiet diſpoſition, and ſuffered his manager to touch him on all the parts of his body. He grew unruly when he was ſtruck, or was hungry; and in both caſes he could not be appeaſed without giving him ſomething to eat. When he was angry, he leaped forward with impetuoſity and furiouſly beat the walls with his head.

This rhinoceros, when he was two years old, was not much higher than a young cow; but his body was very long, and very thick. The tongue of this rhinoceros was ſoft, like that of a calf: his eyes had no vivacity: they are like thoſe of a hog in form, and are placed very low.

It is certain, that ſome rhinoceroſes have but one horn in the noſe, and others two: it is not equally certain, however, that this variety is conſtant, for it always depends on the climate of Africa, or the Indies. Hence two diſtinct ſpecies of theſe animals may be eſtabliſhed, in conſequence of this difference. It ſeems, that the rhinoceroſes that have but one horn, have it larger and longer than thoſe that have two. There are ſingle horns of three feet and a half, and perhaps of more than four feet, by ſix or ſeven inches in diameter at the baſis; there are alſo double horns which are but two feet in length. Theſe horns are generally brown, or of an olive-colour; yet ſome are grey, and even white. They have only a ſmall concavity, in form of a cup, at their baſis, by which they are faſtened to the ſkin of the noſe; and the remaining part of the horn is ſolid, and very hard. It is with this weapon that the rhinoceros is ſaid to attack, and ſometimes to wound the largeſt elephants, whoſe long legs afford the rhinoceros an opportunity of ſtriking them with his horn under the belly, where the ſkin is tender, and more penetrable; but, if he miſſes the firſt blow, the elephant throws him on the ground, and kills him.

The horn of the rhinoceros is more valued by the Indians than the ivory of the elephant. Not ſo much, however, on account of the matter, of which they make ſeveral works with the chiſſel, but for its ſubſtance, to which they attribute various ſpecific virtues, and medicinal properties. The white ones, as the moſt rare, are alſo thoſe which they value moſt.

The rhinoceros, without being ferocious or carnivorous, or even very wild, is, nevertheleſs, untameable. He is of the nature of a hog, blunt and grunting, without intellects, without ſentiment, and without tractableneſs. Theſe animals are alſo, like the hog, prone to wallow in the mire; they are fond of damp and marſhy places, and ſeldom leave the banks of rivers. They are found in Aſia and Africa, in Bengal, Siam, Laos, in the Mogul dominions, in Sumatra, in Java, in Abyſſinia, in Ethiopia, and about the Cape of Good Hope. But, in general, the ſpecies is not ſo numerous, or ſo univerſally diffuſed, as that of the elephant. The female brings forth but very ſeldom and only one at a time. In the firſt month, the rhinoceros is not much bigger than a large dog; he has not, when firſt brought forth, the horn on the noſe, although the rudiment of it is ſeen in the fœtus. When he is two years old, this horn is only an inch long; and when ſix, it is about ten inches; and, as ſome of theſe horns have been ſeen very near four feet long, they perhaps grow during the whole life of the animal, which it is probable, is about ſeventy or eighty years.

Without being uſeful as the elephant, the rhinoceros is very hurtful, by the prodigious devaſtation which he makes in the fields. The ſkin is the moſt valuable thing of this animal. His fleſh is excellent, according to the taſte of Indians and Negroes. Kolbe ſays, he has often eaten it with great pleaſure. His ſkin makes the beſt and hardeſt leather; and not only his horn, but all the other parts of his body, and even his blood, his urine, and his excrements, are eſteemed as antidotes againſt poiſon, or a remedy againſt ſeveral diſeaſes. Theſe virtues, however, are perhaps only imaginary.

The rhinoceros feeds upon herbs, thiſtles, prickles, ſhrubs, and he prefers this wild food to the ſweet paſture of the verdant meadows; he is very fond of ſugar-canes, and eats all ſorts of corn. Having no taſte whatever for fleſh, he does not moleſt ſmall animals, neither fears the large ones, living in peace with them all, even with the tiger, who often accompanies him, without daring to attack him. I doubt, therefore, whether the battles betwixt the elephant and the rhinoceros have any foundation: they muſt, at any rate, ſeldom happen, as there is no notice for war on either ſide. Beſides, no ſort of antipathy has been obſerved to ſubſiſt between them. Some have been ſeen living amicably together, even in a ſtate of captivity.

The rhinoceroſes do not herd together, nor march in troops, like the elephant. They are wilder, and more ſolitary, and perhaps more difficult to be hunted and ſubdued. They never attack men unleſs provoked; but then they become furious, and very formidable. The ſteel of Damaſcus, the ſcymitars of Japan, cannot make an inciſion in his ſkin. The darts and lances cannot pierce him through. His ſkin even reſiſts the balls of a muſket; and thoſe of lead become flat upon his leather, neither can the iron ingots penetrate it. The only places that can be penetrated even with the cuiraſs, are the belly, the eyes, and round the ears. Huntſmen, therefore, inſtead of attacking this animal ſtanding, follow him at a diſtance by his track, and wait to approach him when he either ſleeps or reſts. We have in the King's cabinet a fœtus of a rhinoceros which was ſent from the iſland of Java, and extracted from the body of the dam. It was ſaid, in a memorial which accompanied this preſent, that twenty-eight huntſmen had aſſembled to attack this rhinoceros. They had followed her for ſome days, one or two of them walking now and then before, to reconnoitre the poſition of the animal. By theſe means they ſurpriſed her when ſhe was aſleep, and ſilently approached ſo near her, that they diſcharged, all at once, the contents of their twenty-eight guns into the lower parts of her belly.

This animal has a good ear; it is alſo affirmed, that he has the ſenſe of ſmelling in perfection; but it is pretended, he has not a good eye, and ſees only before him. His eyes are ſo ſmall, and placed ſo low, and ſo obliquely, they have ſo little vivacity and motion, that this fact needs no other confirmation. His voice, when he is mild, reſembles

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the grunting of a hog; and when he is angry, his ſharp cries are heard at a great diſtance. Though he lives upon vegetables, he does not ruminate. Hence, it is highly probable, that, like the elephant, he has but one ſtomach, and very large bowels, which ſupply the office of the paunch. His conſumption, though very great, is not equal to that of the elephant; and it appears, by the thickneſs of his ſkin, that he loſes leſs than the elephant by perſpiration.

The camel and the dromedary.

Theſe two names do not include two different ſpecies, but only intimate two diſtinct breeds, ſubſiſting from time immemorial, in the camel ſpecies. The only perceptible character by which they differ, conſiſts in the camel having two hunches, or protuberances, and the dromedary only one. The latter is alſo much leſs, and not ſo ſtrong as the camel; but both of them herd and copulate together; and the production from this croſs breed is moſt vigorous, and valuable.

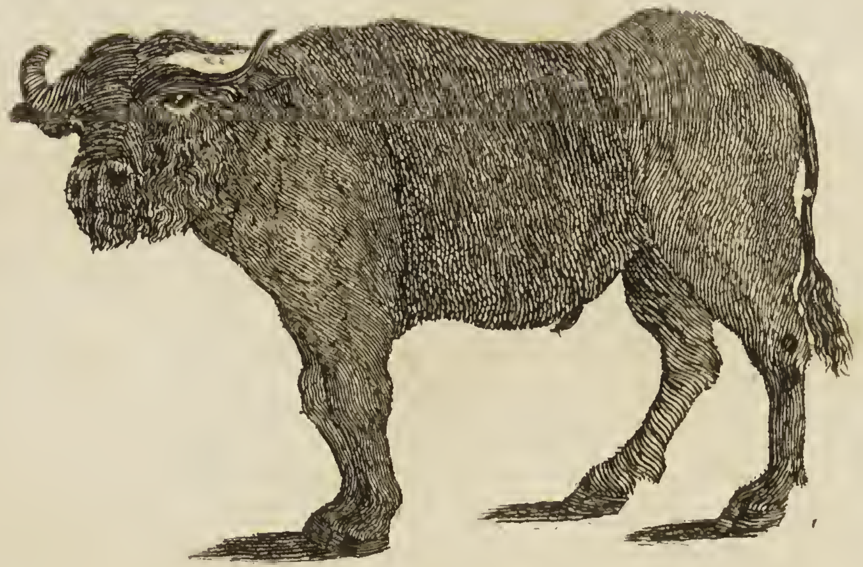
This mongrel iſſue from the dromedary and the camel, form a ſecondary breed, which alſo mix and multiply with the firſt; ſo that in this ſpecies, as well as in that of other domeſtic animals, there are to be found a great variety, according to the difference of the climates where they are produced. Ariſtotle has judiciouſly diſtinguiſhed the two principal breeds; the firſt (which has two hunches), by the name of the *Bactrian Camel;* and the ſecond, by that of the *Arabian Camel;* the the firſt are called *Turkman*, and the others *Arabian Camels*. This diviſion ſtill ſubſiſts, with this difference only, that it appears, ſince the diſcovery of thoſe parts of Africa and Aſia which were unknown to the ancients, that the dromedary is, without compariſon, more numerous and more univerſal than the camel; the laſt being ſeldom found but in Turkey, and in ſome other parts of the Levant. While the dromedary, on the other hand more common than any other beaſt of his ſize, is to be found in all the northern parts of Africa, which extends from the Mediterranean to the Black Sea; in Egypt, in Perſia, in South Tartary, and in all the northern parts of India.

The dromedary, therefore occupies an immenſe tract of land, while the camel is confined to a ſmall ſpot. The firſt inhabits hot and parched regions; the ſecond, a more moiſt and temperate ſoil. The camel appears to be a native of Arabia; for it is not only the country where there is the greateſt number, but it is alſo moſt conformable to them. Arabia is the moſt parched country in the world; and the camel is the leaſt thirſty of all animals. The land is almoſt in every part dry and ſandy; the feet of the camel are formed to travel in ſand; while, on the contrary, he cannot ſupport himſelf in moiſt and ſlippery ground. Herbage is almoſt unknown in this country, as is alſo the ox, whoſe place is ſupplied by the camel.

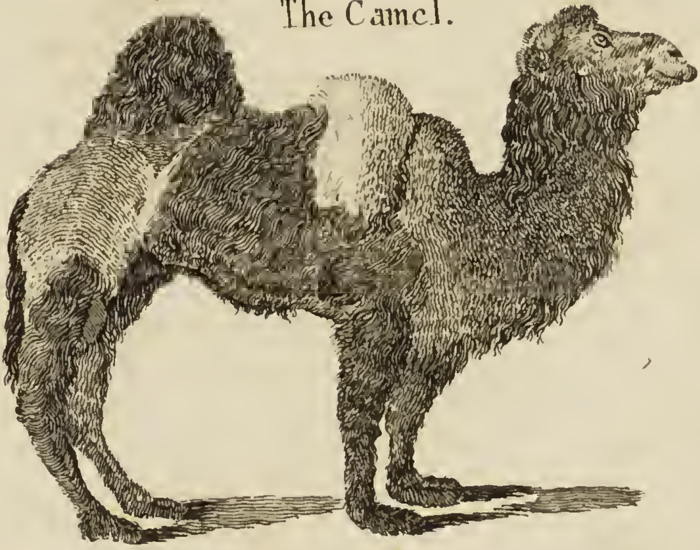
The Arabs regard the camel as a preſent from heaven, a ſacred animal, without whoſe aid they could neither ſubſiſt, trade, nor travel. The milk of theſe beaſts is their common nouriſhment; they likewiſe eat their fleſh, eſpecially that of the young ones, which they reckon very good. The hair of theſe animals, which is fine and ſoft, is renewed every year, and ſerves them to make ſtuffs for their cloathing and their furniture. Bleſt with their camels, they not only want for nothing, but they even fear nothing. With them they can, in a ſingle day place fifty miles of a deſart between them and their enemies; and

Plate 12.

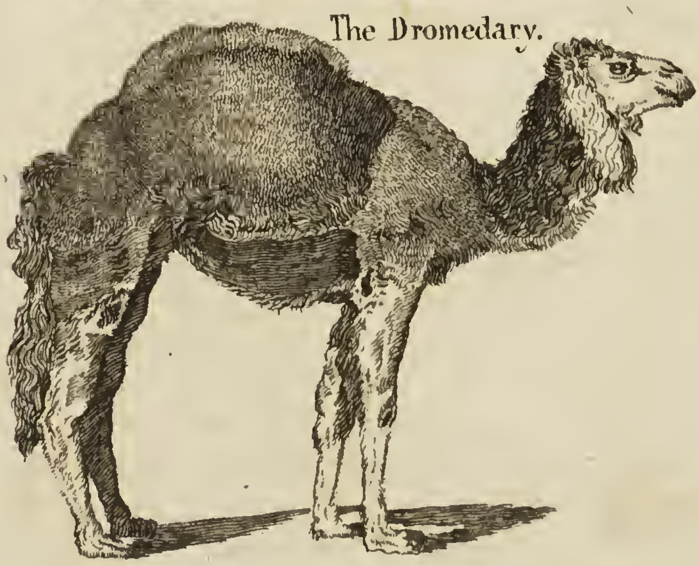
The Buffalo.



The Camel.



The Dromedary.



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all the armies in the world would periſh in the purſuit of a troop of Arabs. Let any one figure to himſelf a country without verdure, and without water, a burning ſun, a ſky always clear, plains covered with ſand, and mountains ſtill more parched, the whole deſtitute of any animal whatever, a dead earth, *flayed* (if I may be allowed the expreſſion) by the winds, which preſents nothing but bones of dead bodies, flints ſcattered here and there, rocks overthrown; a deſart entirely naked, where the traveller never breathed under the hoſpitable ſhade, and where nothing reminds him of living nature. A perfect ſolitude, a thouſand times more frightful than that of the foreſt (for trees appear as beings to the man who, thus deſolate, thus naked, and thus loſt in theſe void and unbounded places, looks over all the extended ſpace as his tomb); an immenſity which he in vain attempts to run over; for hunger, thirſt, and burning heat, preſs on him every diſtracted moment that remains between deſpair and death.

Nevertheleſs, the Arab has found means to ſurmount theſe difficulties, and even to appropriate to himſelf theſe gaps of Nature. They ſerve him for an aſylum, and conſtitute his independence.—But why does not man know how to make uſe of them without abuſe? This ſame Arab, free, independent, tranquil, and even rich, inſtead of reſpecting theſe deſarts as the ramparts of his liberty, ſoils them with guilt. He traverſes over them to the neighbouring nations, and robs them of their ſlaves and gold. He renders them ſubſervient to his robberies, which, unfortunately, he enjoys more than his liberty; for his enterprizes are almoſt always ſucceſsful. Notwithſtanding the caution of his neighbours, and the ſuperiority of their forces, he eſcapes their purſuit, and bears off the fruit of his rapine with impunity.

An Arab who deſtines himſelf to this buſineſs of land piracy, early inures himſelf to ſpend many ſleepleſs days; to endure hunger, thirſt, and heat; and at the ſame time he initiates his camels, in the ſame principles. When they are but a few days old, he bends their legs under their bellies, and conſtrains them to remain on the ground, and loads them, in this ſituation, with a weight as heavy as they uſually carry, which he only relieves them from to give them a heavier. Inſtead of ſuffering them to feed at every hour, and drink when they are thirſty, he regulates their repaſts, and, by degrees, increaſes them to greater diſtances between each meal, diminiſhing at the ſame time, the quantity of their food. When they are a little ſtronger, he exerciſes them to the courſe; he excites them by the example of horſes, and endeavours to render them ſwifter, and more robuſt. At length, when he is aſſured of the ſtrength and ſwiftneſs of his camels, and that they can endure hunger and thirſt, he then loads them with whatever is neceſſary for his and their own ſubſiſtence. He departs with them, arrives unexpectedly at the borders of the deſart, ſtops the firſt paſſenger he ſees, pillages the ſtraggling habitations, and loads his camels with his booty. If purſued, and forced to retreat, then he diſplays all his own and his animal's talents. Mounted on one of his ſwifteſt camels, he conducts the troop, makes them travel day and night, almoſt without ſtopping either to eat or to drink. In this manner, he eaſily paſſes over three hundred miles in eight days; and, during all that time of fatigue and travel, he never unloads his camels, and only allows them an hour of repoſe, and a ball of paſte each day. They often run in this manner for eight or nine days without a drop of water; and when by chance they find a pool at ſome diſtance from their route, they ſcent the water at more than half a mile off. Thirſt now makes them redouble their pace; and then they drink enough for all the time paſt, and for as long to come; for often they are many weeks in travelling; and their abſtinence continues as long as their journey.

In Turky, Perſia, Egypt, Arabia, Barbary, &c. they uſe no other carriage for their merchandize than camels, which is, of all their conveyances, the cheapeſt and beſt. Merchants, and other travellers, aſſemble themſelves in caravans, to avoid the inſults and piracies of the Arabs. Theſe caravans are very numerous, and often compoſed of more camels than men. Every one of theſe camels is loaded according to his ſtrength; and he is ſo ſenſible of it himſelf, that when a heavier load than uſual is put upon him, he refuſes it, by conſtantly remaining in his reſting poſture, till part of his burden is removed.

Large and ſtrong camels generally carry 1000, and even 1200 weight; the ſmall only 6 or 700. In theſe commercial journeys, they do not travel quick; and, as the route is often ſeven or eight hundred miles, they regulate their ſtages. They only go ten or twelve miles every day; they are diſburthened every evening, and are ſuffered to feed at liberty. If they are in a part of the country where there is paſture, they eat enough in one hour to ſerve them twenty-four, and to ruminate on during the whole night; but they ſeldom meet with paſtures, and this delicate food is not neceſſary for them. They even ſeem to prefer wormwood, thiſtles, nettles, furze, and other thorny vegetables, to the milder herbs; and ſo long as they can find ſuch plants to brouze on, they very eaſily live without water.

This facility with which they abſtain ſo long from drinking, is not pure habit, but rather an effect of their formation. Independent of the four ſtomachs which are commonly found in ruminating animals, the camel is poſſeſſed of a fifth bag, which ſerves him as a reſervoir for the water. This fifth ſtomach is peculiar to the camel. It is of ſo vaſt a capacity, as to contain a great quantity of liquor, where it remains without corruption, or without the other aliments being able to mix with it. When the animal is preſſed with thirſt, or has occaſion to dilute the dry food, and to macerate it for rumination, he makes a part of this water re-aſcend into the ſtomach, and even to the throat, by a ſimple contraction of the muſcles.

This animal bears about him all the marks of ſlavery and pain; below the breaſt, upon the ſternum, is a thick and large calloſity, as tough as horn. A ſimilar ſubſtance appears upon the joints of the legs; and although theſe calloſities are to be met with in every camel, yet they plainly prove that they are not natural, but produced by an exceſſive conſtraint, and pain, as appears from their being often full of pus. It is therefore evident, that this deformity proceeds from the cuſtom to which theſe animals are conſtrained, of forcing them, when quite young, to lie upon their ſtomach with their legs bent under them, and in that cramped poſture to ſupport not only the weight of their body, but alſo the burdens with which they are loaded. Theſe poor animals muſt ſuffer a great deal, as they make lamentable cries, eſpecially when they are over-loaded; and, notwithſtanding they are continually abuſed, they have as much ſpirit as docility. At the firſt ſign, they bend their legs under their bodies, and, kneeling upon the ground, they are unloaded with the greateſt eaſe, without the trouble of lifting up the load to a great height, which muſt happen, were they to ſtand erect. As ſoon as they are loaded, they raiſe themſelves up again, without any aſſiſtance or ſupport; and the conductor, mounted on one of them, precedes the whole troop, which follow in the ſame pace as he leads. They have neither need of whip nor ſpur to excite them; but, when they begin to be fatigued, their conductors ſupport their ſpirits, or rather charm their wearineſs, by a ſong, or the ſound of ſome inſtrument. When they wiſh to prolong the rout, or double the day's journey, they give him an hour's reſt; after which, renewing their ſong, they again proceed on their way for many hours more, and the ſinging continues until the time that they ſtop. Then the camels again kneel down on the earth, to be relieved from the burden, by the cords being untied, and the bales rolled down on each ſide. They remain in this cramped poſture, with their belly couching upon the earth, and ſleep in the midſt of their baggage, which is tied on again next morning with as much readineſs as it was untied before they went to reſt. Theſe are, however, not their only inconveniencies: they caſtrate them when young. They leave but one male for eight or ten females; and all the labouring camels are commonly gelt. Theſe are weaker, no doubt, than thoſe which are not caſtrated; but they are more tractable than the others, who are not only indocile, but almoſt furious, in the rutting time, which remains forty days, and which happens every ſpring. The female goes with young exactly a year, and, like all other large animals, produces but one at a birth. They have great plenty of milk, which is thick, and nouriſhing even for the human ſpecies if it is mixed with a more equal quantity of water. The females ſeldom do any labour while they are with young, but are ſuffered to bring forth at liberty. The profit which ariſes from their produce, and from their milk, is perhaps more than what is got from their labour; nevertheleſs, in ſome places, a great part of the females undergo caſtration, as well as the males, in order to render them more fit for labour. In general, the fatter the camels are, the more capable they are of enduring great fatigues. Their hunches appear to be formed only from the ſuperabundance of nouriſhment; for, in long journeys, where they are obliged to ſtint them in their food, and where they ſuffer both hunger and thirſt, theſe hunches gradually diminiſh, and are reduced almoſt even. The eminences are then only diſcovered by the height of the hair, which is always much longer upon theſe parts than upon any other part of the back.

The young camel ſucks its dam a year; and when they want to make him ſtrong and robuſt, they leave him at liberty to ſuck or graze for a longer time, nor begin to load him, or put him to labour, till he has attained the age of four years. The camel generally lives forty or fifty years.

The camel is not only of greater value than the elephant, but perhaps not of leſs than the horſe, the aſs, and the ox, all united together. He alone carries as much as two mules; he not only alſo eats leſs, but likewiſe feeds on herbs as coarſe as the aſs. The female furniſhes milk a longer time than the cow. The fleſh of young camels is good and wholeſome, like veal. Their hair is finer, and more ſought after than the fineſt wool; Sal ammoniac is made from their urine; their dung, when dried and powdered, ſerves either themſelves or their horſes for litter. In fine, a kind of turf is alſo made of this dung, which burns freely, and emits a flame as clear, and almoſt as lively, as that of dry wood. Even this is another great uſe, eſpecially in deſarts, where not a tree is to be ſeen, and where, from the deficiency of combuſtible matters, fire is almoſt as ſcarce as water.

The Buffalo, the Aurochs, the Biſon, and the Zebu.

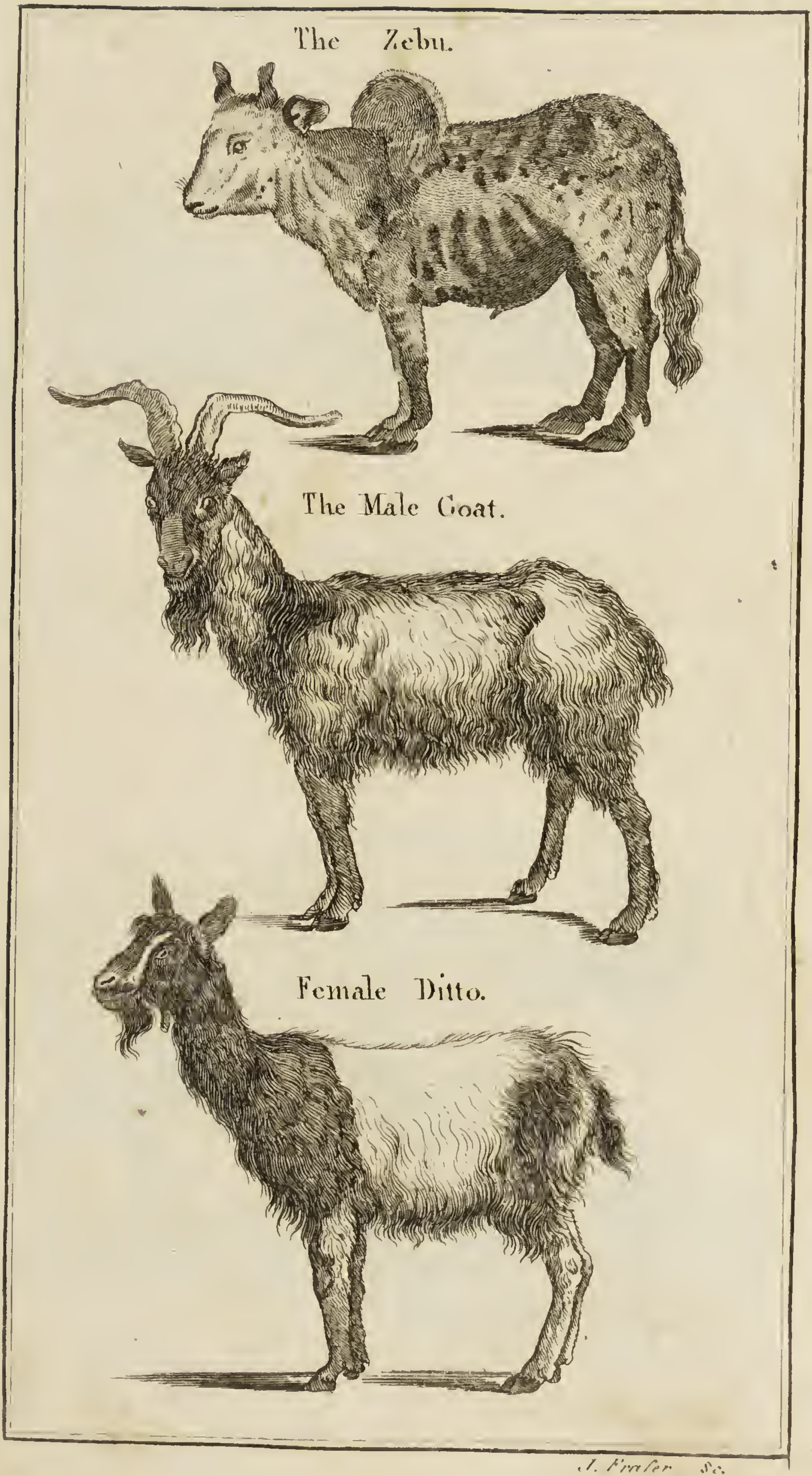
Although the Buffalo is, at preſent common in Greece, and tame in Italy, it was neither known by the Greeks or Romans; for it never had a name in the language of theſe people. The word *buffalo* even indicates a ſtrange origin, not to be derived either from the Greek or Latin tongues. In fact, this animal is originally a native of the hotteſt countries of Africa and India, and was not tranſported and naturalized in Italy, till towards the ſeventh century. It is true, the ancients have ſpoken of an animal, as of a different ſpecies from the ox, under the name of *bubalus;* and Ariſtotle has called the wild ox of Pæonia, *bonaſus.* Both the ancients and moderns, however, have multiplied the ſpecies needleſsly; and, from attentive obſervation, I am clearly of opinion, that there are but two ſpecies which are eſſentially different, viz. the ox, and the buffalo.

We may obſerve, throughout the different regions of the world, the breed of oxen differing from each other in all external appearances, according to the nature of the climate, or other circumſtances; but the moſt remarkable difference is that which divides them into two claſſes, viz. the *aurochs*, or ox without a hunch on its back, and the *biſon*, or hunched ox. From indubitable facts, however, we are authorized to conclude, that theſe are no other than varieties of the ſame ſpecies. The hunch, the length and quality of the hair, and the form of the horns, are the ſole characters by which the biſon is diſtinguiſhed from the aurochs. But the hunched oxen copulate and produce with our oxen; and we likewiſe know, that the length and quality of the hair, in all animals, depends on the nature of the climate. Beſides we may remark that, in oxen, goats, and ſheep, the form of the horns is various and fluctuating. Theſe differences, therefore, do not ſuffice to eſtabliſh two diſtinct ſpecies; and, ſince our tame ox of Europe copulates with the hunched ox of India, we have the greateſt reaſon to believe that it would alſo copulate with the biſon, or hunched ox of Europe. Notwithſtanding this, however, we need not be ſurpriſed, that the two kinds have not melted or coaleſced into a mungrel breed, ſince many circumſtances may have occurred to keep them aſunder. Beſides, we actually find that theſe kinds have ſubſiſted till this preſent time, either in a free and wild, or in a tame ſtate; and are ſcattered, or rather have been tranſported into all the climates of the earth. All the tame oxen without hunches have proceeded from the aurochs, and all with hunches from the biſon. In order to give a juſt idea of the varieties, we ſhall make a ſhort enumeration of theſe animals, as they are found to be in the different parts of the earth.

To begin with the north of Europe, the few oxen and cows which ſubſiſt in Iceland are deſtitute of horns, although they are of the ſame kind as our oxen. The ſize of theſe animals is rather relative to the plenty and quality of the paſture, than to the nature of the climate.

The

Plate 14.



The Zebu.

The Male Goat.

Female Ditto.

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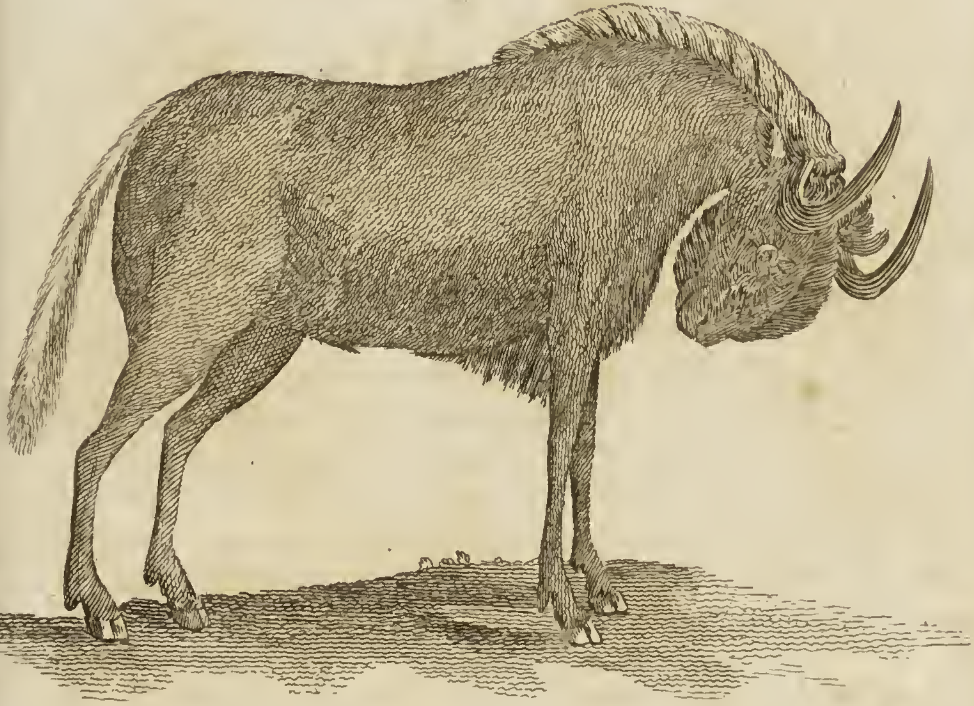
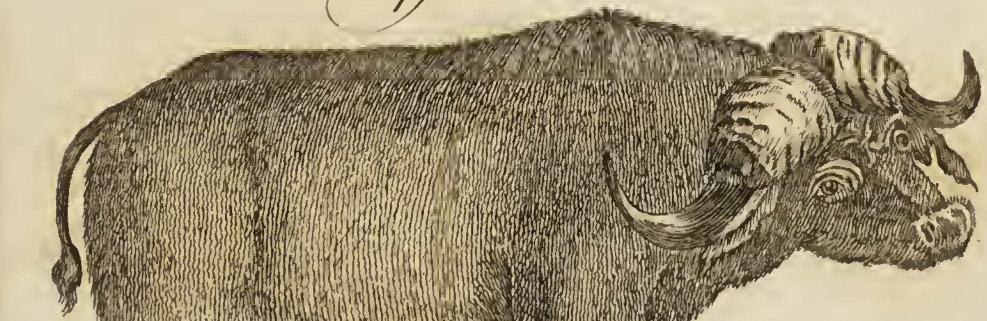
Gnu



Buffalo



D. Lizars Sculp'

The Dutch have often brought lean cows from Denmark, which fatten prodigiouſly in their meadows, and which give plenty of milk. Theſe Denmark cows are longer than ours. The oxen and cows of Ukrain, where there is excellent paſture, are ſaid to be the largeſt in Europe: but they are of the ſame kind with our oxen.

The breed of aurochs, or ox without a hunch, inhabits the cold and temperate zones. It is not very much diſperſed towards the ſouthern countries. On the contrary, the breed of the biſon, or hunched ox, fills all the ſouthern provinces. In the whole continent of India; in the Iſlands of the South Seas; and in all Africa, from Mount Atlas to the Cape of Good Hope, we find almoſt nothing but hunched oxen; and it appears, that this breed, which has prevailed in all the hot countries, has many advantages over the others. Theſe hunched oxen, like the biſon, from which they are ſprung, have the hair much ſofter, and more gloſſy than our oxen, which like the auroch, are furniſhed but with little hair, which is of a harſh nature. Theſe hunched oxen are alſo ſwifter, and more proper to ſupply the place of a horſe; and at the ſame time they have a leſs brutal nature, and are not ſo clumſy and ſtupid as our oxen: they are more tractable, and ſenſible which way you would lead them; they are alſo treated with more tenderneſs in their country, than the fineſt horſes are in ours. The regard the Indians have for theſe animals is ſo great, as to have almoſt degenerated into ſuperſtition, the laſt mark of blind reſpect. The ox, as the moſt uſeful animal, has appeared to them to be the moſt worthy of being revered. Upon this account they have made an idol of the oject of their veneration.

Theſe hunched oxen, perhaps, vary again more than ours, in the colours of the hair, and the figure of the horns. The handſomeſt are all white, like the oxen of Lombardy; there are alſo ſome that are deſtitute of horns; there are others that have them very much elevated, and others ſo bent down, that they are almoſt pendant. It even appears, that we muſt divide this firſt kind of biſons, or hunched oxen, into two ſecondary kinds; the one very large, and the other very ſmall: this laſt is that of the *zebu*. Both of them are found nearly in the ſame climates; and both are equally mild and eaſy to drive. In ſhort, both have ſoft hair, and a hunch on the back. This hunch does not depend on the conformation of the ſpine, nor on the bones of the ſhoulder. It is nothing but an excreſcence, which is as palatable as the tongue of an ox The wens of ſome oxen weigh about forty or fifty pounds; others have them much ſmaller; ſome of theſe oxen have alſo prodigious horns for their ſize. There is one in the French King's cabinet, which is three feet and an half long, and ſeven inches in diameter at the baſe. Many travellers affirm, that they have ſeen them capacious enough to contain fifteen, and even twenty pints of water.

Thus all the ſouthern parts of Africa and Aſia are inhabited with hunched oxen, or biſons, among which a great variety is to be met with in reſpect to ſize, colour, ſhape of the horns, &c On the contrary, all the northern countries of theſe two parts of the world, and Europe entirely, comprehending even the adjacent iſlands, to the Azores, are only inhabited by oxen without a hunch, that derive their origin from the aurochs. The biſon, or wild hunched ox, is ſtronger, and much larger than the tame ox of India. It is alſo ſometimes ſmaller; but that depends only on the quantity of food. At Malabar, at Abyſſinia, at Madagaſcar, where the meadows are naturally ſpacious and fertile, the biſons are of a prodigious ſize. In Africa and Arabia Petræa, where the land is dry, the zebus, or biſons are ſmalleſt.

Every part of South America is inhabited by oxen without hunches, which the Spaniards, and other Europeans, have ſucceſsfully tranſported. Theſe oxen are multiplied, and are only become leſs in theſe new countries In all the northern parts, as far as Florida, Louiſiana, and even as far as Mexico, the biſons, or hunched oxen, are found in great numbers. Theſe biſons, which formerly inhabited the woods of Germany, Scotland, and other northern countries, have probably paſſed from the one continent to the other, and are become, like other animals, ſmaller in this new world; and as they are habituated to climates more or leſs cold, they have preſerved their coat more or leſs warm. Their beard is longer at Hudſon's Bay than at Mexico; and, in general, this hair is ſofter than the fineſt wool.

Thus the wild and the tame ox, the European, the Aſian, the American, and the African ox, the bonaſus, the aurochs, the biſon, and the zebu, are all animals of one and the ſame ſpecies, which according to the climates, food, and different uſage they have met with, have undergone all the variations we have already explained. The ox, as the moſt uſeful animal, is alſo the moſt univerſally diſperſed. He appears ancient in every climate, tame among civilized nations, and wild in deſert or unpoliſhed countries. He ſupports himſelf by his own ſtrength when in a ſtate of nature, and has never loſt the qualities relative to the ſervice of man. The young wild calves which are taken from their mothers in India and Africa, have, in a ſhort time, become as tractable as thoſe which are the progeny of the tame kind; and this natural conformity is another ſtriking proof of the identity of the ſpecies.

If it be aſked, whether the aurochs or the biſon, claims the firſt place? it appears to me, that a ſatisfactory anſwer may be drawn from the facts we have juſt ſpecified. The hunch or wen of the biſon is probably no other than an accidental character, which is effaced in the mixture of the two kinds. The aurochs, or ox without an hunch, then, is the moſt powerful and predominant of the two; for, if it was the contrary, the hunch, inſtead of diſappearing, would extend and remain upon every one of this mixed breed What confirms and proves ſtill more the indentity of the ſpecies of biſon and aurochs, is, that the biſons, or hunch-backed oxen, in the north of America, have ſo ſtrong a ſmell, that they have been called *muſk oxen* by the greateſt number of travellers; and, at the ſame time, we learn that the aurochs, or wild ox of Pruſſia and Livonia, has the ſmell of muſk, like the biſon of America.

There remain, therefore, but two ſpecies, the buffalo and ox, out of all the names placed at the head of this chapter; to each of which the ancient and modern naturaliſts have given a ſeparate and diſtinct ſpecies. Theſe two animals, although they are very like each other, and often live under the ſame roof, and feed in the ſame meadow, yet, they have ever refuſed to copulate with one another. Their nature is more diſtant than that of the aſs is from the horſe. There even appears to be a ſtrong antipathy between them; for it is affirmed, that cows will not ſuckle the young buffaloes; and the female buffalo refuſes the ſame kindneſs to other's calves. The buffalo is of a more obſtinate nature, and leſs tractable than the ox. He obeys with greater reluctance, and his temper is more coarſe and brutal. Like the hog, he is one of the filthieſt of all tame animals, as he ſhews by his unwillingneſs to be cleaned and dreſſed. His figure is very clumſy, and forbidding: his look ſtupidly wild: he carries his tail in an ignoble manner, and his head in a very bad poſture, almoſt always inclined towards the ground. His voice is a hideous bellowing, with a tone much ſtronger, and more hoarſe than that of the bull: his legs are thin, his tail bare, and his phyſiognomy dark, like his hair and ſkin. He differs externally from the ox, cheifly in the colour of his hide, which is eaſily perceived under the hair, with which he is but ſparingly furniſhed: his body is likewiſe thicker and ſhorter than that of the ox: the legs are longer, and proportionably much leſs: the horns are not ſo round, black, and partly compreſſed, with a tuft of hair frizzled over his forehead: his hide is likewiſe thicker and harder than that of the ox: his fleſh is black and hard, and not only diſagreeable to the taſte, but to the ſmell: the milk of the female is not ſo good as that of the cow; nevertheleſs, ſhe yields a greater quantity. In hot countries, almoſt all the cheeſe is made of buffaloes milk. The fleſh of the young buffaloes, though killed during the ſuckling time, is not good. The hide alone is of more value than all the reſt of the beaſt, whoſe tongue is the only part that is proper to eat. This hide is firm, light, and almoſt impenetrable. As theſe animals, in general, are larger and ſtronger than the oxen, they are very ſerviceable in the plough: they draw well, but do not carry burdens: they are led by the means of a ring paſſed through their noſe. Two buffaloes harneſſed, or rather chained to a waggon, will draw as much as four ſtrong horſes. As they carry their tails and their heads naturally downwards, they employ the whole force of their body in drawing; and this heavy maſs greatly exceeds that of a horſe or a labouring ox.

The form and thickneſs of the buffalo alone are ſufficient to indicate that he is a native of the hotteſt countries. The largeſt quadrupeds belong to the torrid zone in the Old Continent; and the buffalo, for his ſize and thickneſs, ought to be claſſed with the elephant, the rhinoceros, and the hippopotamus. The camel is more elevated, but ſlenderer, and alſo an inhabitant of the ſouthern countries of Africa and Aſia. Notwithſtanding this, the buffaloes live and multiply in Italy, in France, and in other temperate provinces. Thoſe that are in the French King's menagerie, have brought forth two or three times. The female has but one at a time, and goes about twelve months; which is another proof of the difference between this ſpecies and that of the cow, which only goes nine months. It appears alſo that theſe animals are gentler in their native country; and the hotter the climate is, the more tractable is their nature. In Egypt they are more ſo than in Italy; and in India they are more ſo than in Egypt. Thoſe of Italy have alſo more hair than thoſe of Egypt, and thoſe of Egypt more than thoſe of India. Their coat is never entirely covered, becauſe they are natives of hot countries; and, in general, large animals of this climate have either no hair, or elſe very little.

There are a great number of wild buffaloes in the countries of Africa and India, which are watered with many rivers, and furniſhed with large meadows. Theſe wild buffaloes go in droves, and make great havock in cultivated lands; but they never attack the human ſpecies, and will not run at them, unleſs they are wounded. At this time they are very dangerous; for they make directly at their enemy, throw him down, and trample him to death under their feet; they are greatly terrified, however, at the ſight of fire, and are diſpleaſed at a red colour.

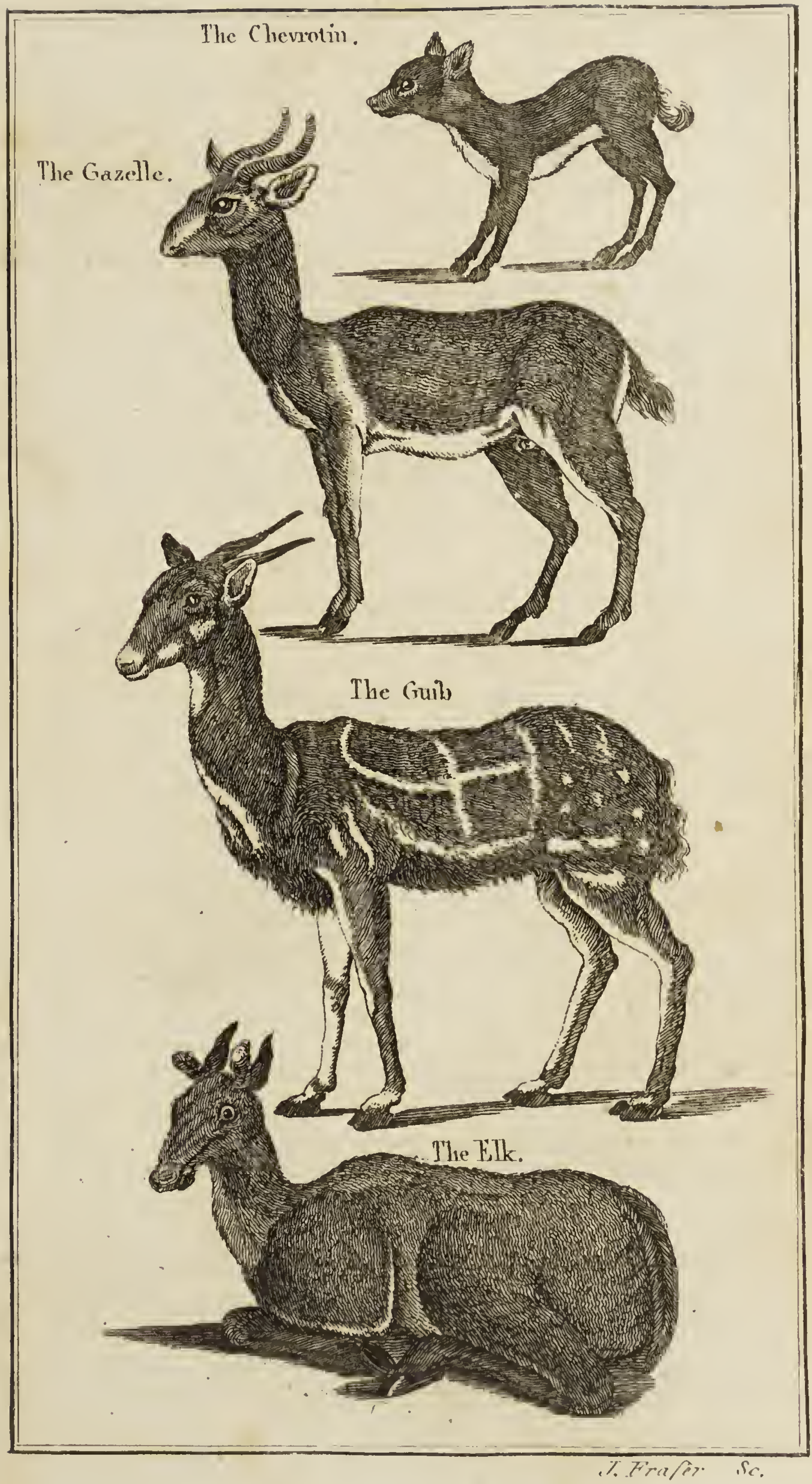
The buffalo, like all other animals of warm climates, is fond of bathing, and even of remaining in the water: he ſwims very well, and boldly traverſes the moſt rapid flood. As his legs are longer than thoſe of the ox, he runs alſo quicker upon land. The Negroes in Guinea, and the Indians in Malabar, where the wild buffaloes are very numerous, often hunt them. They neither purſue them nor attack them openly, but, climbing up the trees, or hiding themſelves in the woods, they wait for them, and kill them; the buffaloes not being able, without much trouble, to penetrate theſe foreſts, on account of the thickneſs of their bodies, and the incumberance of their horns. Theſe people are fond of the fleſh of the buffalo, and make great profit by vending their hides and their horns, which are harder and better than thoſe of the ox. The animal that is called in Congo *empacapa*, or *pacaba*, though very ill deſcribed by travellers, ſeems to me to be the buffalo. That too which they have ſpoken of, under the name of *empabunga*, or *impaluzca*, in the ſame country, is probably the bubalus.

C H A P. XVII.

OF THE MUFFLON, AND OTHER SHEEP—THE AXIS—THE TAPIR—THE ZEBRA—THE HIPPOPOTAMUS—THE ELK, AND REIN DEER.

The Muſſlon, and other Sheep.

THE breed of ſheep, though perhaps originally all of the ſame ſpecies, yet are found to be very different in different countries. Our domeſtic ſheep is only to be met with in Europe, and in ſome of the moſt temperate provinces in Aſia, and if tranſported into Guinea, loſes its wool, and is covered with hair. It increaſes there but little, and its fleſh has no longer the ſame taſte. It cannot ſubſiſt in cold countries; but even in thoſe, and in Iceland, a breed of ſheep is to be found, with many horns, ſhort tails, harſh and thick wool, under which, as in almoſt every animal in the north, is a ſecond lining, of a ſofter, finer, and thicker wool. In warm climates, ſome are covered with wool, others with hair, and a third kind with hair mixed with wool. The firſt kind of thoſe countries, is that commonly called the Barbary or Arabian ſheep, which entirely reſembles the tame kind, except the tail, which is very much loaded with fat, is often more than a foot broad, and weighs upwards of twenty pounds. In external appearance, this ſheep has nothing remarkable, but the tail, which he carries as if a pillow was faſtened to his hinder parts. Among this kind of broad-tailed ſheep, there are ſome whoſe tails are ſo long and heavy, that the ſhepherds are obliged to faſten a ſmall board, and wheels to them, in order to ſupport it as they walk along. In the Levant, theſe ſheep are clothed with a very fine wool. In the hotter countries, as


The Chevrotin.
The Gazelle.
The Guib
The Elk.

J. Fraſer Sc.

Madagaſcar, and Eaſt India, they are cloathed with hair. The ſuperabundance of fat, which in our ſheep fixes upon the reins, in theſe deſcends under the vertebræ of the tail; but the other parts of the body are leſs charged with it than in our fat ſheep. This variety is to be attributed to the climate, the food, and the care of mankind; for theſe broad, or long tailed ſheep, are tame, like thoſe of our country; and they require much more care and management. This breed is much more diſperſed than ours; they are commonly met with in Turkey, Perſia, Syria, Egypt, Barbary, Ethiopia, and Madagaſcar; and even as far as the Cape of Good Hope.

In the iſlands of the Archipelago, and chiefly in the iſland of Candia, there is a breed of ſheep which Bellon has given the figure and deſcription of, under the name of *ſtrepſicheros*. This ſheep is of the make of our common ſheep: it is, like it too, clothed with wool, and only differs from it by the horns, which are ſtraight, and in ſpiral furrows.

In ſhort, in the hotteſt countries of Africa and India, there is a breed of large ſheep, which has rough hair, ſhort horns, hanging ears, and a kind of tuft under the tail. Leon Africanus, and Marmol, call it *adamain*; and it is known to the naturaliſts by the names of the *Senegal ram*, the *Guinea ram*, and the *Angola ſheep*, &c. He is tame like ours, and, like him, ſubject to variety. Theſe, though different in themſelves by particular characters, reſemble each other ſo much in other reſpects, that we can ſcarcely doubt but they are of the ſame kind.

In conſidering, therefore, according to the difference of climate, the ſheep which are purely tame, we find,

1. The ſheep of the north, who have many horns, and whoſe wool is rough and very thick; and the ſheep of the iſland of Goathland, Muſcovy, and many other parts of the north of Europe, whoſe wool is thick, and which appear to be of the ſame breed.

2. Our ſheep, whoſe wool is very good and fine in the mild climates of Spain and Perſia, but in hot countries changes to a rough hair.

3. The broad-tailed ſheep, whoſe wool is very fine in temperate countries, ſuch as Perſia, Syria, and Egypt; but which, in hot countries changes into a hair more or leſs rough.

4. The ſheep *ſtrepſicheros*, or Cretan ſheep that reſemble ours both in wool and make, except the horns, which are ſtraight and furrowed.

5. The *adimain*, or the great ſheep of Senegal and India, is entirely clothed with hair, which is longer or ſhorter, rougher or ſmoother, according to the heat of the climate. All theſe ſheep are only varieties of one and the ſame ſpecies, and certainly would copulate one with the other; for we are certain that the goat, whoſe ſpecies is farther diſtant, copulates with our ſheep. But none of theſe tame ſheep have the characters of an original ſpecies. In the mountains of Greece, in the iſlands of Cyprus, Sardina, Corſica, and in the deſarts of Tartary, the animal which we call the *muſſlon*, is ſtill to be found. It appears to us, to be the primitive ſtock of all ſheep. He lives in a ſtate of nature, and ſubſiſts and multiplies without the help of man; he reſembles the ſeveral kinds of tame ſheep, more than any other animal. He is livelier, ſtronger, and ſwifter than they are. His head, forehead, eyes, and face, are like thoſe of the ram, which he not only reſembles in the form of the horns, but in the whole habit of body. In ſhort, he co-

pulates with the tame ſheep, which alone is ſufficient to demonſtrate, that he is of the ſame ſpecies, and the primitive ſtock of the different breeds.

The only difference betwixt the muſflon and our ſheep is, that the firſt is covered with hair inſtead of wool; but we have obſerved, that, even in tame ſheep, the wool is not an eſſential character, but a production of a temperate climate. Hence, it is not aſtoniſhing, that the original, or primitive and wild ſheep, who has endured cold and heat, lived and increaſed, without ſhelter, in the woods, is not covered with wool, which he would ſoon be robbed of by the thickets and thorny buſhes. Beſides, when a he-goat is coupled with a tame ſheep, the production is a lamb covered with hair, which returns to the original ſpecies, and which appears to indicate, that our goats, and tame ſheep, have ſomething common to them both in their origin.

The Axis.

This animal being only known by the vague names of the *hind* of *Sardinia*, and the *deer* of the *Ganges*, we have thought it neceſſary to preſerve the name which Bellon has given to him, and which he borrowed from Pliny. The axis is of the ſmall number of ruminating animals that wear horns, like the ſtag. He has the ſhape and ſwiftneſs of the fallow-deer; but what diſtinguiſhes him from the ſtag, and fallow-deer, is, that his body is marked with white ſpots, elegantly diſpoſed, and ſeparated one from another, and that he is a native of hot countries: the ſtag and the deer on the other hand, have their coat of an uniform colour, and are to be met with in greater numbers, in cold countries and temperate regions, than in hot climates.

The gentlemen of the Academy of Sciences have only given him the name of the *Sardinian hind*, becauſe, very probably, they received that name from the royal menagerie; but there is nothing indicated of this animal being a native of Sardinia. No author has ever mentioned, that he exiſts in that iſland like a wild animal; but, on the contrary, we are told, that he is found in the hotteſt countries of Aſia.

We have already remarked, that there is no ſpecies which approaches ſo near to another, as that of the deer to the ſtag. Notwithſtanding this the axis appears to be an intermediate mixture between the two. He reſembles the deer in the ſize of his body, length of his tail, and his coat, which is the ſame during his whole life. He can hardly be ſaid to differ from that animal in any thing but in his horns, which nearly reſemble thoſe of the ſtag. The axis, therefore, may poſſible be only a variety depending on the climate, and not a different ſpecies from the deer; for, although he is a native of the hotteſt countries of Aſia, he thrives well enough in Europe. There are many herds of them in the menagerie of Verſailles; but it has never been obſerved, that they mix either with the deer or with the ſtags. Hence we preſume, that it was not a variety of one or the other, but a particular and mediate ſpecies between the two.

The Tapir, or the Anta.

The Tapir, or the Anta, is the largeſt animal in America, where, as we have ſaid, living Nature ſeems to be leſſened, or rather has not had time to arrive at its greateſt dimenſions. The animals alſo of South America, which alone properly and originally belong to this New Continent, are almoſt without defence, without horns, and without tails. Their bodies and their limbs are unproportioned; and ſome, as the ſluggiſh and crawling animals, &c. are of ſo miſerable a nature, that they ſcarcely have the faculties of moving or of eating. They drag on with pain, a languiſhing life, in the ſolitude of a deſert, and cannot ſubſiſt in the inhabited world, where man and powerful animals would ſoon have deſtroyed them.

The tapir is of the ſize of a ſmall cow, or zebu, but without horns, and without a tail; the legs are ſhort; the body crooked, like that of the hog. In his youth, he wears a coat like that of the ſtag, and afterwards, uniform ſpots, of a dark brown colour: his head is thick and long, with a kind of trunk, like the rhinoceros: he has ten inciſive teeth, and ten grinders, in each jaw; a character which entirely ſeparates him from the ox, and other ruminating animals.

The tapir appears to be a dull and dark animal, that never ſtirs out but in the night, and delights in the water, where he oftener lives than upon land. He is chiefly to be found in marſhes, and ſeldom goes far from the borders of rivers or lakes. When he is threatned, purſued, or wounded, he plunges into the water, and remains there till he has got to a diſtance before he makes his ſecond appearance. Theſe cuſtoms, which he has in common with the hippopotamus, have made ſome naturaliſts imagine him to be of the ſame ſpecies; but he differs as much from him in nature, as he is diſtant from him in climate. To be aſſured of this, we need only compare their deſcriptions with thoſe we have given of the hippopotamus. Notwithſtanding the tapir inhabits the water, he does not feed upon fiſh; and, although his mouth is armed with twenty ſharp and inciſive teeth, he is not carnivorous. He lives upon plants and roots, and does not make uſe of what Nature has armed him with againſt other animals. He is of a mild and timid nature, and flies from every attack or danger. His legs are ſhort, and his body maſſive; notwithſtanding which, he runs very ſwift, and ſwims ſtill better than he runs. He is generally found in company, and ſometimes in droves. His fleſh is of a very firm texture, and often reſiſts a bullet; and though it be coarſe and inſipid, the Indians eat it. This animal is commonly found in Braſil, Paraguay, Guiana, and in all the extent of South America, from the extremity of Chilo to New Spain.

The Zebra.

The zebra is perhaps the handſomeſt, and moſt elegantly clothed of all quadrupeds. He has the ſhape and the graces of the horſe, the ſwiftneſs of the ſtag, and a ſtriped robe of black and white, alternately diſpoſed, with ſo much ſymmetry, that it ſeems as if Nature had made uſe of the rule and compaſs to paint it. Theſe alternate bands of black and white, are ſo much the more ſingular, as they are ſtraight, parallel, and very exactly divided, like a ſtriped ſtuff; and as they, in other parts, extend not only over the body, but over the head, the thighs, the legs, and even the ears and the tail. Hence, this animal at a diſtance appears as if he was ſurrounded with little fillets, which ſome perſon had diſpoſed, in a regular manner, over every part of the body. In the females, theſe bands are alternately black and white. In the male, they are black and yellow, but always of a lively and brilliant mixture, upon a ſhort, fine, and thick hair, the luſtre of which adds to the embelliſhment of the colours. The zebra is, in general, leſs than the horſe, and larger than the aſs; and, although it has often been compared to thoſe two animals, and called the *wild horſe*, and the *ſtriped aſs*, it is a copy neither of the one nor the other, but might rather be called their model, if every ſpecies had not an equal right to creation.

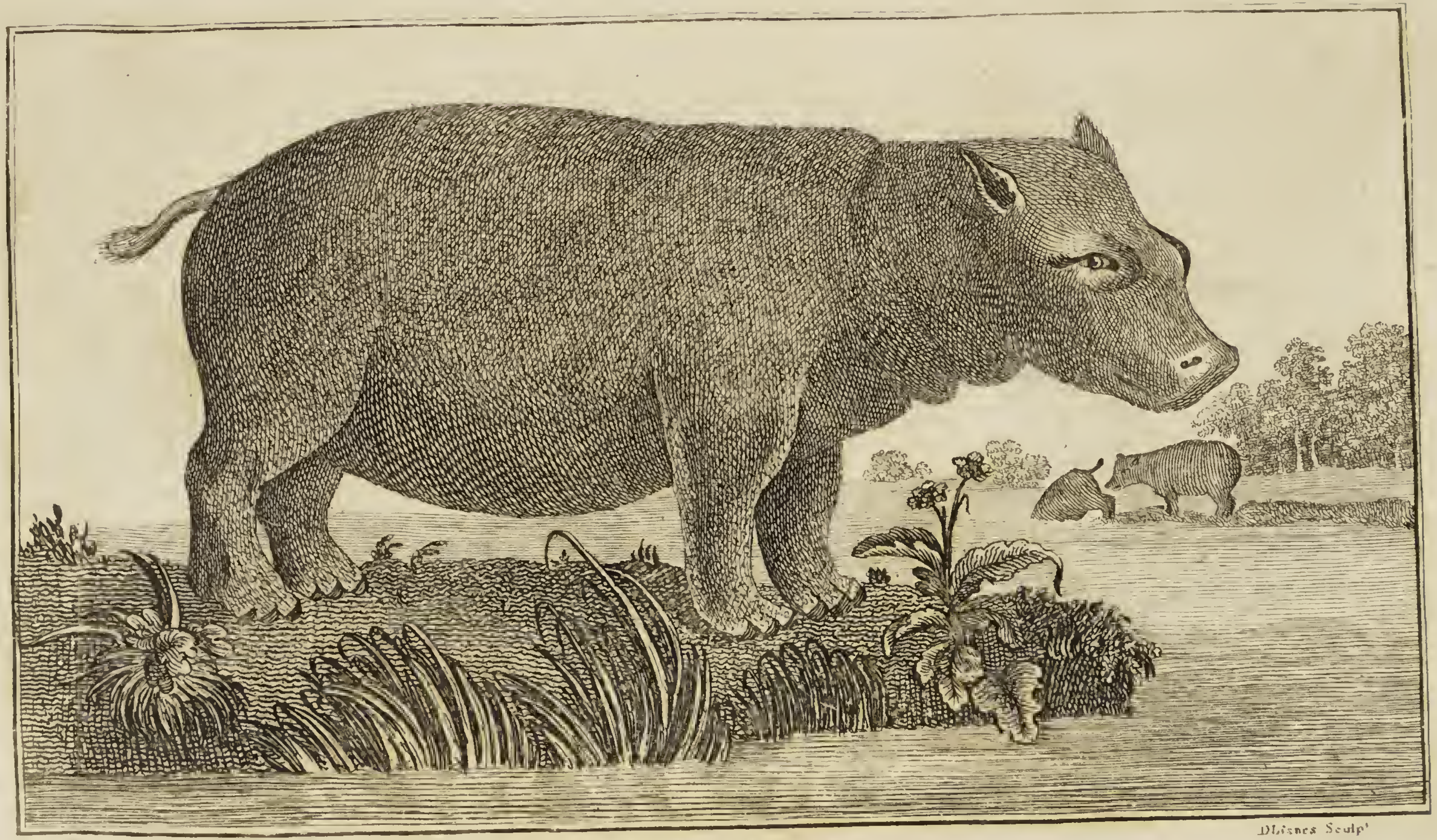
The zebra is not the animal the ancients have denominated *onagra*. There exiſts in the Levant, the eaſtern parts of Aſia, and in the northern parts of Africa, a beautiful race of aſſes, that like the fineſt horſes, are natives of Arabia. This race differs from the common, by the ſize of the body, the ſlenderneſs of the legs, and the luſtre of the hair. They are of an uniform, but commonly of a fine mouſe colour, with a black croſs upon the back and the ſhoulders; and ſometimes they are a bright grey, with a flaxen croſs. The zebra is alſo of a different climate from the onagra, and is only to be met with in the moſt eaſtern and moſt ſouthern parts of Africa, from Ethiopia to the Cape of Good Hope, and thence to Congo. It exiſts neither in Europe, Aſia, nor America, nor even in all the northern parts of Africa. Thoſe which ſome travellers tell us they have ſeen at the Braſils, have been tranſported thither from Africa. Thoſe which others are ſaid to have ſeen in Perſia, and in Turkey, have been brought from Ethiopia; and, in ſhort, thoſe that we have ſeen in Europe, are almoſt all from the Cape of Good Hope. This point of Africa is their true climate, their native country, and where the Dutch have employed all their cares to ſubject them, and to render them tame, without having been hitherto able to ſucceed. That which we have ſeen, and which has ſerved for the ſubject of our deſcription, was very wild when he arrived at the royal menagerie in France; and he was never entirely tamed. Notwithſtanding this, he has been broken for the ſaddle; but two men had to hold the bridle, while a third was upon him. His mouth is very hard; and his ears are ſo ſenſible, that he winces whenever any perſon is about to touch him. He was reſtleſs as a vicious horſe, and obſtinate as a mule; but perhaps the wild horſe, and the onagra, are not leſs intractable. And there is reaſon to believe, that, if the zebra was accuſtomed to obedience and tameneſs, from his earlieſt years, he would become as mild as the aſs or horſe, and might be ſubſtituted in their room.

The Hippopotamus.

Although this animal has been celebrated from the earlieſt ages, it was, notwithſtanding, but imperfectly known to the ancients. It is only towards the ſixteenth century, that we have been able to procure any accurate information on the ſubject.

In comparing the relations of different travellers, the hippopotamus appears to be an animal whoſe body is longer and thicker than that of the rhinoceros; but his fore legs are much ſhorter. His head is ſhort and thick in proportion to the body. He has no horns, neither on the noſe like the rhinoceros, nor on the head like ruminating animals. His cry, when hurt, approaches as near to the neighing of a horſe, as to the bellowing of the buffalo. His uſual voice, however, reſembles the neighing of a horſe, from which, he differs in every other reſpect; and this fact, we may preſume, has been the ſole reaſon for giving him the name of *hippopotamus*, which ſignifies a *river-horſe;* as the howling of the lynx, which reſembles that of the wolf, has occaſioned him to be called the *ſtag-like wolf*. The inciſive teeth of the hippopotamus, and eſpecially the two canine teeth of the lower jaw, are very long,

very



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HIPPOPOTAMUS.

very ſtrong, and of ſo hard a ſubſtance, that they ſtrike fire with a piece of iron. This is probably what has given riſe to the fable of the ancients, who have reported that the hippopotamus vomited fire. Theſe canine teeth of this animal are ſo white, ſo clean, and ſo hard, that they are preferable to ivory, for making artificial teeth. The inciſive teeth of the hippopotamus, eſpecially thoſe of the lower jaw, are very long, cylindrical, and furrowed. The canine teeth, which are alſo very long, are crooked, priſmatic and ſharp, like the tuſks of a boar. The molares are ſquare, or rather longer on one ſide than the other, nearly like the grinders of a man, and ſo thick, that a ſingle one weighs more than three pounds. The largeſt of the inciſive, or canine teeth, are twelve, and even ſixteen inches long, and ſometimes weigh twelve or thirteen pounds each.

The male hippopotamus is about ſix feet nine inches long, from the extremity of the muzzle to the beginning of the tail. They are fifteen feet in circumference, and ſix feet and a half high. His legs are about two feet ten inches long; the length of the head, three feet and an half, and eight feet and an half in circumference: the width of the mouth is two feet four inches; and the large teeth are above a foot long.

Thus powerfully armed, with a prodigious ſtrength of body, he might render himſelf formidable to every animal; but he is naturally gentle, and is at the ſame time ſo heavy and ſlow, that he cannot poſſibly catch any other quadruped in the chace. He ſwims quicker than he runs, purſues the fiſh and makes them his prey. He delights much in the water, and ſtays there as willingly as upon land; notwithſtanding which, he has no membranes between his toes like the beaver and otter. Hence it is evident that the great eaſe with which he ſwims, is only owing to the great capacity of his body, which is nearly of an equal weight with the water. Beſides, he remains a long time under water, and walks at the bottom as well as he does in the open air. When he quits it to graze upon land, he eats ſugar-canes, ruſhes, millet, rice, roots, &c. of which he conſumes and deſtroys a great quantity; but, as he is more timid upon earth than in the water, he is very eaſily driven away; and, as his legs are ſhort, he cannot ſave himſelf well by flight, if he is far from the water. His reſource, when he finds himſelf in danger, is to plunge himſelf into the water, and not to appear till he be at a great diſtance. He generally retreats from his purſuers; but if he is wounded, he becomes irritated, and, immediatly facing about with great fury, ruſhes againſt the boats, ſeizes them with his teeth, often tears pieces out of them, and ſometimes ſinks them under water. "I have ſeen," ſays a traveller, "an hippopotamus open his mouth, fix one tooth on the ſide of a boat, and another to the ſecond plank under the keel; that is, four feet diſtant from each other, pierce the ſide through and through, and ſink the boat to the bottom. I have ſeen another, lying by the ſide of the ſea-ſhore, upon which the waves had driven a ſhallop heavily loaded, which remained upon his back dry, and which was again waſhed back by another wave, without the animal appearing to have received the leaſt injury. When the Negroes go to fiſh in their canoes, and meet with an hippopotamus, they throw fiſh to him, which makes him paſs without giving them any farther diſturbance. He injures moſt when he can reſt himſelf againſt the earth; but when he floats in the water, he can only bite. Once, when our ſhallop was near ſhore, I ſaw one of them get below it, lift it above water upon his back, and overſet it, with ſix men who were in it; but who fortunately received no hurt."

" We dare not," ſays another traveller, " irritate the hippopotamus in the water, ſince an adventure happened, which was likely to prove fatal to three men. They ſet out in a ſmall canoe, to kill one in a river where the water was about eight or ten feet deep. After they had diſcovered him walking at the bottom, according to his cuſtom, they wounded him with a long lance, which enraged him ſo much, that he roſe immediately to the ſurface of the water, ſtared at them with a terrible look, opened his mouth, and, at one bite, took a great piece out of the ſide of the canoe, and had very nearly overturned it; but he replunged, almoſt inſtantaneouſly, to the bottom of the water."

Theſe animals are only numerous in ſome parts of the world. It even appears, that the ſpecies is confined to particular climates, and ſeldom to be met with but in the rivers of Africa. Dutch travellers ſay, that they bear three or four young ones; but this appears to me very ſuſpicious. As the hippopotamus is of an enormous bulk, he is in the claſs of the elephant, the rhinoceros, the whale, and all other great animals, that bring forth but one at a time; and this analogy appears to be more certain than all the teſtimonies that they have given.

The Elk and the Rein-Deer.

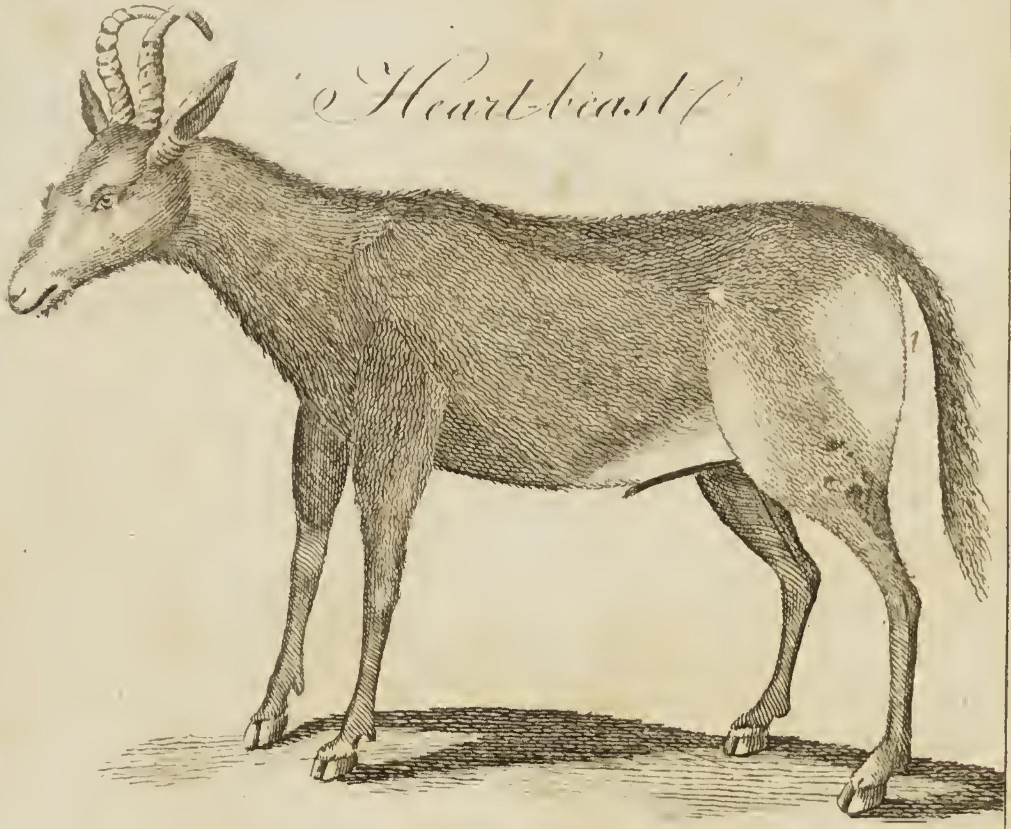
Although the elk and the rein-deer are two animals of different ſpecies, we have thought proper to unite them, becauſe it is ſcarcely poſſible to write the hiſtory of the one, without borrowing a great deal from the other.

It appears, by poſitive teſtimonies, that the rein-deer formerly exiſted in France, at leaſt in the high mountains, ſuch as the Pyrenean, and, ſince that time, he has been deſtroyed like the ſtags, that were formerly common in this country. It is certain, that the rein-deer is now actually to be found only in the moſt northern countries. We alſo know, that the climate of France was formerly much more damp and cold, occaſioned by the number of woods and moraſſes, which are no longer to be ſeen. Gaul, under the ſame latitude as Canada, was, two thouſand years ago, what Canada is at this preſent time; a climate cold enough for theſe animals to live in.

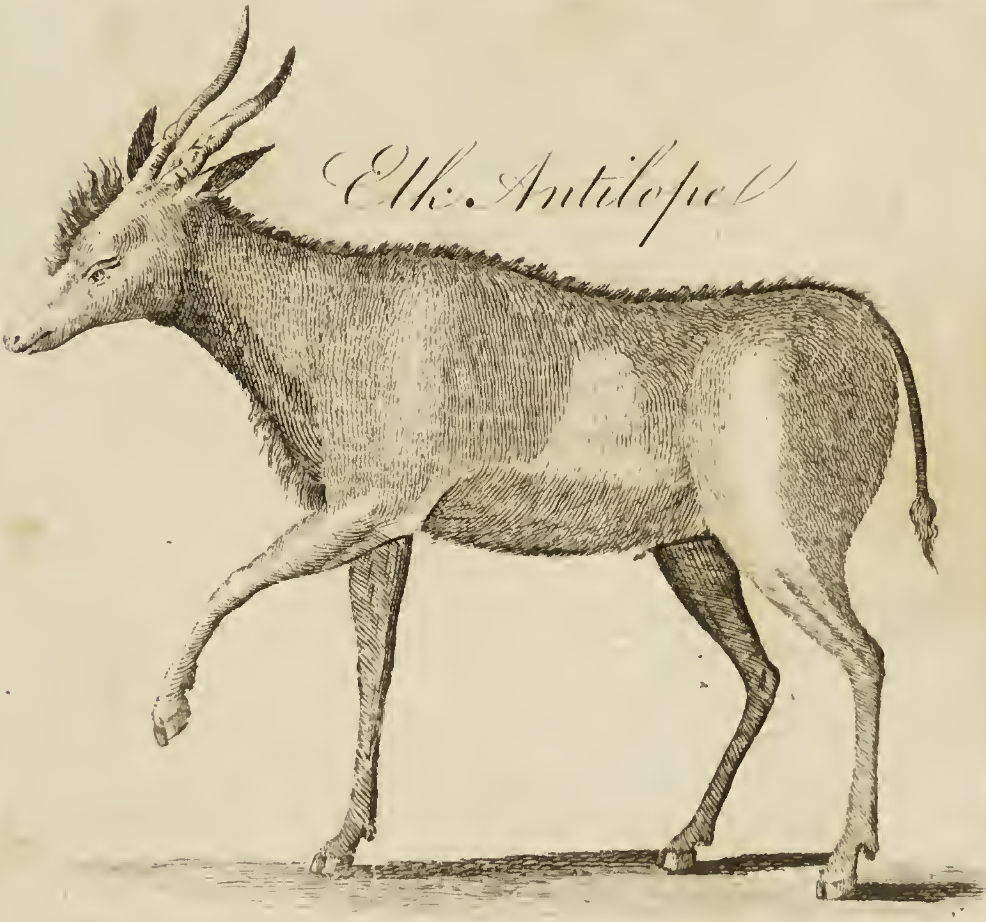
The elk and the rein-deer, therefore are only found in the northern countries: the elk on this, and the rein-deer on the other ſide of the polar circle in Europe and in Aſia. We find them in America in the higheſt latitudes, becauſe the cold is greater there than in Europe. The rein-deer can bear even the moſt exceſſive cold. He is found in Spitſbergen; he is common in Greenland, and in the moſt northern parts of Lapland. Hence, in the moſt northern parts of Aſia, the elk does not approach ſo near the pole. He inhabits Norway, Sweden, Polonia, Ruſſia, and all the provinces of Siberia and Tartary, with the north of China. We again find him by the name of *orignal*, and the rein-deer under that of *caribou*, in Canada, and in all the northern parts of America.

We may form a juſt enough idea of the elk and the rein-deer, by comparing them with the ſtag The elk is larger, thicker, and ſtands more erect upon his legs. His neck is ſhorter, his hair longer, and his antlers wider and heavier than thoſe of the ſtag. The rein-deer is ſhorter and more ſquat: his legs are ſmaller and thicker, and his feet

wider:



Heart-beast



Elk Antilope

D Lizars Sculp

wider: the hair very thickly furniſhed, and his antlers much longer, and divided into a greater number of branches, with flat terminations; while thoſe of the elk are only (if I may uſe the expreſſion) cut or broached at the edges. Both have long hair under the neck, and both have ſhort tails, and ears much longer than the ſtag. They do not leap or bound like the roe bucks; but their pace is a kind of trot, ſo eaſy and quick, that they go over almoſt as much ground, in the ſame time as the ſtags do, without being ſo much fatigued; for they can trot in this manner, for a day or two. The rein-deer lives upon the mountains: but the ſtag only dwells in low lands and damp foreſts. Both go in herds, like the ſtags, and both can be eaſily tamed, but the rein-deer with greater eaſe than the elk. The laſt, like the ſtag, has not loſt his liberty, while the rein-deer is become domeſtic among the unenlightened part of mankind. The Laplanders have no other beaſt. In the icy climate of Lapland, which only receives the oblique rays of the ſun, where there is a ſeaſon of night as well as of day, where the ſnow covers the earth from the beginning of autumn to the end of ſpring, and where the verdure of the ſummer conſiſts in the bramble, juniper and moſs, could man form any idea but of famine? The horſe, the ox, the ſheep, all our uſeful animals, find no ſubſiſtence there, nor can they reſiſt the rigour of the cold. He has been obliged to ſearch among the inhabitants of the foreſt, for the leaſt wild and moſt profitable animals. The Laplanders have done what we ourſelves ſhould do, if we were to loſe our cattle. We ſhould then be obliged to tame the ſtags and the roe-bucks of the foreſts, to ſupply their place; and I am perſuaded we ſhould render them as ſubſervient to our uſe as the Laplanders do their rein-deer. We ought to be ſenſible, by this example, how far Nature has extended her liberality towards us. We do not make uſe of all the riches which ſhe offers us: the fund is much more immenſe than we imagine it. She has beſtowed on us the horſe, the ox, the ſheep, and all our other domeſtic animals, to ſerve us, to feed us, and to clothe us; and ſhe has, beſides, ſpecies in reſerve, which would be able to ſupply this defect, and which would only require us to ſubject them. Man does not ſufficiently know what Nature can do, nor what can be done with her. Inſtead of ſeeking for what he does not know, he likes better to abuſe her in what he does know.

In comparing the advantages which the Laplanders derive from the tame rein-deer, with thoſe which we derive from our domeſtic animals, we ſhall ſee that this animal is worth two or three of them. He is uſed, as horſes are, to draw ſledges and other carriages: he travels with great ſpeed and ſwiftneſs; he travels thirty miles a day, and runs as well upon frozen ſnow as upon the moſſy down. The female affords milk more ſubſtantial, and more nouriſhing, than that of the cow; the fleſh is very good to eat; his coat makes an excellent fur; and his dreſſed hide becomes very ſupple and durable leather. Thus the rein-deer alone affords all that we derive from the horſe, the ox, and the ſheep.

The antlers of the rein-deer are larger, more extended, and divided into a greater number of branches, than thoſe of the ſtag. His food, in the winter ſeaſon, is a white moſs, which he finds under the ſnow, and which he plows up with his horns, digs up with his feet.

In ſummer, he lives upon the buds and leaves of trees, rather than on herbs, which his forward-ſpreading antlers will not permit him to brouſe on with eaſe. He runs upon the ſnow, and ſinks but little, on account of his broad feet. Theſe animals are mild; and they bring them up in herds, which turns out greatly to the profit of their keepers. The richeſt Laplanders have herds of four or five hundred head of rein-deer and the poor have only ten or twelve. They lead them to paſture, and lead them back to the ſtable, or ſhut them up in parks during the night, to ſhelter them from the fury of the wolves. If they attempt to change their climate, they die in a ſhort time. Some centuries ago, Steno, prince of Sweden, ſent ſix to Frederick, duke of Holſtein; and, in 1533, Guſtavus, king of Sweden, had ten brought over to Pruſſia, both males and females. All periſhed, without producing any young, either in a domeſtic, or in a free ſtate.

There are both wild and tame rein-deer in Lapland. When the tame females are in rut, they ſometimes let them looſe, to ſeek the wild males; and, as theſe wild males are robuſt, and ſtronger than the tame, thoſe of this mixture are preferred. Theſe rein-deer are not ſo gentle as the others; for they not only ſometimes refuſe to obey thoſe who guide them, but they often turn furiouſly upon them, attack them with their feet, ſo that there is no other reſource than to cover themſelves from their rage by the ſledge, until the fury of the beaſt is ſubſided. This ſledge is ſo light, that they can eaſily manage and cover themſelves with it. The bottom of it is lined with the ſkins of the young rein-deer: the hairy ſide is turned againſt the ſnow, ſo that the ſledge glides eaſily forwards, and recoils leſs on the mountains. The harneſs of the rein-deer is only a thong of the hide, with the hairs remaining on it, round the neck, whence it deſcends towards the breaſt, paſſes under the belly, between the legs, and is faſtened to a hole which is in the fore part of the ſledge. The Laplander has only a ſingle cord with which he guides the animal, and which he throws indifferently upon the back of the beaſt, ſometimes on one ſide, and ſometimes on the other, according as he would direct him to the right or left. They can travel four or five miles an hour; but the quicker this method of travelling is, the more it is inconvenient. A perſon muſt be well accuſtomed to it, and travel often, to be able to direct this ſledge, and prevent it from turning over.

The rein-deers have many things in their external appearance in common with the ſtags: and the formation of the interior part is, if the expreſſion is allowable, the ſame. The rein-deer ſheds his antlers every year like the ſtag, and, like him, is very good veniſon. The females, of both ſpecies, go eight months with young, and produce but one at a birth. The young rein-deer follows her dam during the firſt two or three years, and does not attain his full growth till about the age of four or five. It is at this age, that they begin to dreſs and exerciſe them for labour.

The rein-deers are all very ſpirited, and very difficult to manage; they therefore make uſe of only thoſe which are caſtrated, among which they chuſe the livelieſt and the ſwifteſt to draw their ſledges, and the heavier to travel with their proviſion and baggage at a ſlower pace. Theſe animals are troubled with an inſect, called the gad-fly, during the ſummer ſeaſon, which, burrowing under their ſkins the preceding ſummer, depoſit their eggs. Hence the ſkin of the rein-deer is often ſo full of ſmall holes, that an incurable diſorder is the conſequence.

The herds of this ſpecies require a great deal of care. The rein-deer are ſubject to elope, and voluntarily renew their natural liberty. They muſt be cloſely attended, and narrowly watched. They cannot lead them to paſture but in open places; and, in caſe the herd is numerous, they have need of ſeveral perſons to guard them, and to run after them, if they ſtray. They are all marked, that they may be known again; for it often happens, that they ſtray in the woods, or mix with another herd. In ſhort, the Laplanders are continually occupied in the care of their rein-deer, which conſtitute the whole of their opulence.

The rein-deer is the only animal of this ſpecies the female of which has horns like the male; and the only one alſo which ſheds his horns, and renews them again, notwithſtanding his caſtration. In ſtags, fallow-deer, and roe-bucks, on the contrary, that have undergone this operation, the head of the animals remain always in the ſame ſtate in which it was when caſtrated.

Another ſingularity, which is common to the rein-deer and the elk, is, that when theſe animals run, or quicken their pace, their hoofs, at every ſtep, make a crackling noiſe, as if all the joints of their legs were disjointing. It is the noiſe, or perhaps the ſcent, which informs the wolves of their approach, and, if the wolves are many in number, they very often obtain the victory. The rein-deer is able to defend himſelf againſt a ſingle wolf, not, as may be imagined, with his horns but with his fore-feet, which are very ſtrong, and with which he ſtrikes with ſuch force, as to ſtun the wolf, and to drive him away. After this he flies with ſuch ſpeed, as not to be overtaken. A more dangerous, though a leſs frequent, and leſs numerous enemy than the wolf, is the *roſomack*, or *glutton*. This animal, more voracious, but heavier than the wolf, does not purſue the rein-deer, but climbs and conceals himſelf in a tree, and waits the arrival of his prey. As ſoon as he ſees him within his reach, he ruſhes upon him, and, faſtening himſelf with his nails upon his back, and tearing his head or neck with his teeth, never quits him till he has diſpatched him. He makes the like attack, and uſes the ſame ſtratagems, to conquer the elk, an animal ſtronger than the rein-deer.

The elk and rein-deer are both among the number of ruminating animals.

A tame rein-deer lives only fifteen or ſixteen years; but it is to be preſumed, that the life of the wild rein-deer is much longer. This animal, being four years before he arrives at his full growth, muſt live twenty-eight or thirty years, when he is in his natural ſtate. The Laplanders hunt the wild rein-deers by different methods, according to the difference of ſeaſons. In their rutting time, they make uſe of a tame female to attract the males. They kill them with the muſket, or with the bow and arrow, and bend the bow with ſuch vigour, that, notwithſtanding the thickneſs of the hair, and the firmneſs of the hide, they very often kill one of theſe beaſts with a ſingle arrow.

In general, the elk is a much larger and a much ſtronger animal than the ſtag and the rein-deer. His hair is ſo rough, and his hide ſo hard, that the muſket-ball cannot penetrate it. His legs are very firm, with ſo much motion and ſtrength, eſpecially in the fore feet, that he can kill a man by one ſingle ſtroke of his foot; yet, he is hunted with men and dogs. It is affirmed, that, when he is touched with the lance, or purſued, that he often falls without either being pulled down or wounded. From this circumſtance, it has been conjectured that he is ſubject to the epilepſy, and from this conjecture which is a very abſurd one, a conſequence equally abſurd has been drawn, namely, that his hoof is not only a remedy for, but even an antidote againſt this diſeaſe.

As there are very few people in the northern parts of America, all animals, and particularly elks, abound more there than in the north of Europe. The ſavages are not ignorant of the art of hunting and taking them; they follow them by the track of their feet, very often for many days together; and, by conſtancy and dexterity, they often gain their end. Their method of hunting them in winter is particularly ſingular:—"They make uſe of rackets, or ſnow-ſhoes," ſays Denys, "by means of which, they walk upon the ſnow without ſinking in. The *orignal* does not cover a deal of ground, becauſe of his ſinking in the ſnow, which greatly fatigues him; he eats nothing but the young ſhoots of the trees during the whole year; therefore, where the ſavages find the trees eaten, they preſently meet with the beaſts, which are not far off, and which they approach very eaſily. They throw a dart at them, which is a large club, at the end of which is faſtened a large pointed bone, which pierces like a ſword. If there are many orignals in one troop, they drive them away; for then, the orignals, placing themſelves in a rank, deſcribe a large circle of a mile and a half, or two miles, and ſometimes more. They harden the ſnow ſo much with their feet in turning round, that they no longer ſink in. The ſavages in America wait for their paſſing them, upon which, they diſcharge their darts and diſpatch them."

CHAP. XVII.

OF THE IBEX—THE CHAMOIS, AND OTHER GOATS—THE SAIGA—THE ANTELOPE, OR GAZELLE—OF THE BEZOAR STONE—OF THE BUBALUS, OR STAG LIKE ANTELOPE—THE CONDOMA, OR STRIPED ANTELOPE—THE GUIB, OR HARNESSED ANTELOPE—THE GRIMM—THE CHEVROTINS—THE MAZAME, AND TEMAMACAME—THE COUDOUS, OR INDIAN ANTELOPE—THE MUSK—THE PRODUCTION OF THAT PERFUME.

The Ilex, the Chamois, and other Goats.

ALTHOUGH it appears, that the Greeks were acquainted with the ibex and the chamois, yet they have not deſcribed them by any particular denominations, nor even by any explicit characteriſtics. They have only pointed them out under the generical name of *wild goats*. They probably preſumed, that theſe animals were of the ſame ſpecies with the domeſtic goats, as they have not given them proper names, as they have done to every other different ſpecies of animals. On the contrary, all our modern naturaliſts have regarded the ibex and the chamois as two real and diſtinct ſpecies, and both different from that of our goats.

The male ibex differs from the chamois, by the length, thickneſs and form of the horns: it is alſo much more bulky, vigorous and ſtrong. The female ibex has horns different from the male: they are alſo much ſmaller, and nearly reſembling thoſe of the chamois. In other reſpects, theſe two animals have the ſame cuſtoms, the ſame manners, and the ſame country. The ibex, as he is endowed with more agility, and is ſtronger than the chamois, climbs to the ſummit of the higheſt mountains; while the chamois only lives in the ſecond ſtage. Neither the one nor the other is to be found in the plains: both make their way on the ſnow: both are covered with a firm and ſolid ſkin, and clothed, in winter, with a double fur of very rough hair, and a finer and thicker hair below. Both of them have a black ſtripe on the back, and both have the tail nearly of the ſame ſize. The number of exterior reſemblances is ſo great, in compariſon with the differences, and the conformity of the exterior parts is ſo complete, that, if we reaſon in conſequence of theſe accounts, we might be induced to believe, that theſe two animals are not really of a different ſpecies, but that they are only conſtant varieties of one and the ſame ſpecies. The ibex, as well as the chamois, when taken young and reared along with domeſtic goats, are eaſily tamed; and, imbibe the ſame manners, herd together, return to the ſtable, and probably copulate together, I own, however, that this fact, the moſt important of all, and which alone would decide the queſtion, is not aſcertained.

Let us, now, take a view of the oppoſite reaſons. The ſpecies of the ibex and the chamois both ſubſiſt in a ſtate of nature, and both are conſtantly diſtinct. The chamois ſometimes comes, of his own accord, and joins the flock of our domeſtic ſheep. The ibex never joins them, at leaſt not before it is tamed. The ibex and the he-goat have a very long beard, and the chamois has none. The male and female chamois have very ſmall horns: thoſe of the male ibex are ſo thick and ſo long, that they would ſcarcely be imagined to belong to an animal of its ſize. The horns of the male ibex are not very different from thoſe of the goat; as the female, however, reſembles our goat, and even the chamois, in the ſize and ſmallneſs of the horns, may we not conclude, that theſe animals, the chamois, and the domeſtic goat, are, in fact, the ſame ſpecies, in which the nature of the females is invariable and alike, while the males are ſubject to varieties, which render them different from one another?

The ibex, or wild goat exactly reſembles the domeſtic goat, in the conformation, the organization, and the natural and phyſical habits. It only varies by two ſlight differences; the one externally, and the other internally. The horns of the ibex are longer than thoſe of the he-goat: they have two longitudinal ridges; and thoſe of the goat have but one: they have alſo thick knots, or traverſe tubercles, by which their age is known, while thoſe of the goats are only marked with tranſverſe ſtrokes. The ibex runs as faſt as the ſtag, and leaps with more agility than the roe-buck. All goats are liable to vertigos, which are common to them with the ibex and the chamois, as well as the inclination to climb up rocks. Beſides they continually lick the ſtones, eſpecially thoſe which are ſtrongly impregnated with ſalt-petre, or common ſalt. In the Alps there are rocks which have been hollowed by the tongue of the chamois. Theſe are generally ſoft and calcinable ſtones, in which, there is always a certain quantity of nitre. Theſe natural agreements, theſe conformable cuſtoms, among other circumſtances, appear to me to be ſufficient demonſtrations of the identity of ſpecies in theſe animals.

The ibex and the chamois, one of which I look upon as the male, and the other as the female ſtock of the goat ſpecies, are only found, like the mufflon, the ſource of the ſheep ſpecies, in deſarts, and upon the moſt craggy places of the higheſt mountains. The Alps, Pyrenees, the mountains of Greece, and thoſe of the iſlands of the Archipelago, are almoſt the only places where the ibex and the chamois are to be found. But, although both theſe animals diſlike heat, and only inhabit the region of ſnow and ice, yet they have alſo an averſion to exceſſive cold. In the ſummer, they chuſe the north of the mountains; in winter, they deſcend into the valleys. Neither can they ſupport themſelves on their legs upon the ice, when it is ſmooth; but, if there be the leaſt inequalities on its ſurface, they bound along with ſecurity.

The chace of theſe animals for which the dogs are quite uſeleſs, is very dangerous to men; for ſometimes the animal, finding itſelf hard puſhed, turns and ſtrikes the huntſman and tumbles him headlong from the rock. The chamois is as ſwift, but not ſo ſtrong as the ibex. The ſpecies of this laſt is more numerous; and they commonly go in herds. There are, however, fewer now than there were formerly, at leaſt in the Alps, and Pyrenean mountains.

Mr Perond, ſurveyor of the cryſtal mines in the Alps, having brought over a living chamois, has given us the following information on the natural habits of this animal:—“ The chamois is a wild animal, but eaſily tamed, and very docile. It is about the ſize of a domeſtic goat, and reſembles that animal in many reſpects. It is ſprightly and active beyond expreſſion. Its hair is ſhort, like that of the doe; in ſpring it is of an aſh-colour, and in winter of a blackiſh brown. The large males keep themſelves apart from the reſt, except in their rutting time. The time of their coupling is from the beginning of October to the end of November; and they bring forth in April and March. The young follows the dam for about five months, and ſometimes longer, if the huntſmen, or the wolves, do not ſeparate them. It is aſſerted, that they live between twenty and thirty years. The fleſh of the chamois is palatable; and ſome of the fatteſt afford ten or twelve pounds ſuet, which is far better than that of the goat.

The cry of the chamois is not diſtinctly known. If it has any, it is but faint, and ſomewhat like that of a hoarſe goat; it is by this cry it calls its young; but, when they are frightened, or are in danger of any enemy, or ſome other object not perfectly known to them, they warn the reſt of the flock by a kind of hiſſing noiſe. It is obſervable, that the chamois has a very penetrating eye, and its hearing and ſmell are not leſs acute. When it finds an enemy near, it ſtops, for a moment, and then in an inſtant flies off with the utmoſt ſpeed. When the wind is in its favour, it can ſmell a human creature for more than half a mile diſtant. When this happens, therefore, and it cannot ſee its enemy, but only diſcovers his approach by the ſcent, he begins the hiſſing noiſe with ſuch force, that the rocks and the foreſts re-echo with the ſound. This hiſſing continues as long as the breath will permit. In the beginning it is very ſhrill, but more grave towards the cloſe. The animal then reſts a moment, after this alarm, to inſpect farther into its danger, and, having confirmed the reality of its ſuſpicion, it recommences to hiſs by intervals, till it has ſpread the alarm to a great diſtance. It is then in the moſt violent agitation, ſtrikes the ground forcibly with its fore foot, and ſometimes with both: it bounds from rock to rock: it turns, and looks round: it runs to the edge of the precipice, and when it has obtained a ſight of the enemy, flies from it with all its ſpeed. The hiſſing of the male is much more acute than that of the female: it is performed through the noſtrils, and is, properly, no more than a very ſtrong breath, forced through the noſtrils by fixing the tongue to the palate, keeping the teeth nearly ſhut, the lips open, and a little lengthened. The chamois feeds upon the beſt herbage, and chuſes the moſt delicate parts of plants, flowers, and the moſt tender buds. It is not leſs delicate with regard to ſeveral aromatic herbs, which grow, upon the ſides of the Alps. It drinks but very little, while it feeds upon the ſucculent herbage, and ruminates, like the goat, in the intervals of feeding. Its head is crowned with two ſmall horns, of about half a foot long, of a beautiful black, and riſing from the forehead, almoſt betwixt the eyes. Theſe horns are often uſed for the heads of canes. The hides of theſe animals are very ſtrong and ſupple, and they furniſh ſtuff for good waiſt-coats and and gloves.

The hunting of the chamois is extremely difficult. The moſt uſual way is to hide behind ſome of the rocks, and ſhoot them. The ſportſman is obliged to take great precaution in this buſineſs, and to creep, for a great way, upon his belly, obſerving, at the ſame time, to keep the wind in his face. When he is got within a proper diſtance, and properly ſecured from ſight, he only advances his head and arms, with the piece, from his hiding place, and fires among them. Others hunt this animal, as they do the ſtag, by placing proper perſons at all the paſſages of the glade or valley, and then ſending in others to rouze the game.

The Saiga.

There is a ſort of wild goat found in Hungary, in Tartary, and in South Siberia, which the Ruſſians called *Seigak*, or *Saiga*. It bears a reſemblance to the domeſtic goat, in the ſhape of its body, and in its hair; but, by the ſhape of the horns, and the want of the beard, it approaches nearer the *gazelle*, and appears to be a mixture of theſe two animals.

The ſaiga, by its natural habits, is more like the gazel than the ibex and the chamois; for it does not delight in mountainous countries, but lives upon the hills and plains. It is very agile, very ſwift, and its fleſh has a better reliſh than that of the ibex, or any other wild or tame goat.

The Antelope, or Gazelle.

There have been thirteen ſpecies, or, at leaſt, thirteen very diſtinct varieties, of theſe animals taken notice of. In this uncertainty, in knowing whether they are only varieties, or in fact really different ſpecies, we have thought proper to put them all together, aſſigning to each of them a particular name. The firſt is the common *gazelle*, found in

Syria, in Meſopotamia, and in all the provinces of the Levant, as well as in Barbary, and in all the northern parts of Africa. The horns of this animal are about a foot long, entirely annulated at the baſe, which leſſen into half rings towards the extremity; they are not only ſurrounded with theſe rings, but alſo longitudinally ſurrowed by ſmall ſtreaks. Theſe rings indicate the number of years of their growth, which is commonly about twelve or thirteen. The gazelles in general, and this tribe in particular, greatly reſemble the roe-buck, in the proportions of the body, in its natural functions, in its ſwiftneſs, and in the brightneſs and beauty of its eyes. Theſe reſemblances would incline us to think, that, as the roe buck does not exiſt where the gazelle does, that the roe-buck is only a gazelle, whoſe nature is altered by the influence of the climate, and by the effect of food, did not the gazelle differ from the roe-buck in its horns. Thoſe of the roe-buck, which may be ſaid to be ſolid, fall off, and are renewed every year, like thoſe of the ſtag. On the contrary, the horns of the gazelle are hollow and permanent, like thoſe of the goat. The roe-buck has alſo no gall-bladder, which both the gazelle and the goat have. On the other hand, the gazelles have, in common with the roe-buck, deep pits under the eyes, and reſemble it ſtill more in the colour and quality of the hair, in the bunches upon their legs, which only differ in being upon the fore legs of the gazelle, and upon the hinder legs of the roe-buck. The gazelles, therefore, ſeem to be of a middle nature between the two animals; but, when we conſider, that the roe-buck is an animal which is to be found in both continents, and that the goats, on the contrary, as well as the gazelles, are not to be met with in the New World, we ſhall eaſily perceive, that theſe two ſpecies, the goat and the gazelle, are more nearly related to each other than they are to the roe-buck.

The ſecond gazelle is an animal found in Senegal, and is called the *kevel*. It is ſomewhat leſs than the former, and nearly of the ſize of a ſmall roe-buck. It differs alſo in its eyes, which are much larger; and its horns, inſtead of being round, are flatted on the ſides, as well in the male as in the female. In other reſpects, the kevel is entirely like the gazelle.

The third animal is called the *corin*, the name it bears in Senegal. It greatly reſembles the gazelle and the kevel, but is ſtill leſs than either. Its horns too are much ſmaller, and ſmoother than thoſe of the other two; and the annular prominences belonging to this kind are ſcarcely diſcernible.

In the Royal Cabinet of France, there are ſkins of theſe three different gazelles. There is likewiſe a horn which bears a great reſemblance to thoſe of the gazelle and kevel, and only differs from them in being much thicker. Its thickneſs and length ſeem to indicate a much larger animal than the common gazelle; and it appears to belong to a gazelle which the Turks call *tzeran*, and the Perſians *atur*. This animal, according to Olearius, in ſome meaſure, reſembles our deer, except that it is rather of a red colour than brown. The horns, likewiſe, are without antlers, and reſt upon the back, &c. Mr Gmelin, who deſcribes it under the name of *doheren*, ſays, it reſembles the roe-buck, with this exception, that the horns are like thoſe of the ibex, hollow, and, like them never fall off.

To the four firſt ſpecies or tribes of gazelles, muſt be added two other animals, which reſemble them in many things. The firſt is called *koba* at Senegal, where the French have ſtiled it the *great brown cow.* The ſecond, which we call the *kob*, is alſo an animal of Senegal, which the French have denominated the *ſmall brown cow*. The horns of the kob greatly reſemble thoſe of the gazelle and the kevel; but the ſhape of the head is different: the muzzle is much longer, and there are no pits nor depreſſions under the eyes.

The ſeventh animal of this ſpecies, or of this genus, is a gazelle which is found in the Levant, but more generally in Egypt, and in Arabia. It is called, from its Arabian name *algazelle*. It is ſhaped pretty much like the other gazelles, and is nearly of the ſize of a deer; but its horns are long, ſmall, and but little rounded till towards the extremity, when they turn ſhort with a ſharp flexure. They are black, and almoſt ſmooth, and the annular prominences ſcarcely obſervable, except towards the baſe, where they are a little more viſible. They are about three feet long, while thoſe of the gazelle are generally but one foot, thoſe of the kevel fourteen and fifteen inches, and thoſe of the corin (which, nevertheleſs, reſembles this the moſt), only ſix or ſeven inches.

The eighth animal is that which is vulgarly called the *Bezoar gazelle*, but by the eaſtern nations *paſan*, which name we retain. This gazelle is of the ſize of our domeſtic he-goat; and it has the hair, ſhape, and agility of the ſtag. In moſt reſpects, theſe two ſpecies, the *algazelle* and the *paſan*, appear to us to have a great affinity. They are alſo natives of the ſame climate, and found in the Levant, in Egypt, in Barbary, in Arabia, and Perſia; with this difference, however, that the algazelle feeds upon the plains, and the paſan is only found in the mountains. The fleſh of both is very good food.

The ninth gazelle is an animal which is called *nanguer* at Senegal. It is three feet and an half long, two feet and an half high. It is of the colour of the roe-buck, fallow upon the upper parts of the body, white under the belly and upon the hinder parts, with a white ſpot on the neck. Its horns are prominent, like thoſe of the other gazelles, and are about ſix or ſeven inches long. They are black, and round; but, what is very particular in them, is, that near the points they are crooked forwards, as thoſe of the chamois are bent backwards. Theſe nanguers are very beautiful animals, and very eaſily tamed.

The tenth gazelle is a very common animal both in Barbary, and in Mauritania, and ſo well known to the Engliſh, that they have given it the name of the *antelope*. This animal is of the ſize of a roe-buck, and greatly reſembles the common gazelle and the kevel, yet differs from them in ſo many particulars, that is it conſidered as an animal of a different ſpecies. This antelope has deeper eye-pits than the common gazelle. Its horns are about fourteen inches long, meeting almoſt at the bottom, ſpreading as they riſe, ſo as, at their tips, to be ſixteen inches aſunder. They have the annular prominences of the gazelle and the kevel, but not ſo diſtinguiſhable as in thoſe. But what ſerves particularly to diſtinguiſh this antelope, is, the double flexure, very uniform and remarkable, ſo that the two horns give a tolerable repreſentation of an antique lyre.

In reviewing all the animals of this claſs, we find that there are about twelve ſpecies, or diſtinct varieties, in the gazelles; and, after having carefully compared them, we ſuppoſe, firſt, that the common gazelle, the kevel, and the corin, are only three varieties of one ſpecies. We next imagine, that the tzeiran, the koba, and the kob, are all three varieties of another ſpecies. Thirdly, we preſume, that the algazelle, and the paſan, are only two varieties of the ſame ſpecies; and we imagine that the name *Bezoar gazelle*, which has been given to the paſan, is no diſtinctive character; for we think ourſelves able to prove, that that the Oriental bezoar does not come from the paſan alone, but from all the gazelles and goats which inhabit the mountains of Aſia. Fourthly, it appears, that the nanguers, whoſe horns are crooked forwards, and which, together, compoſe two or three particular varieties, have been indicated by the ancients under the name of the *dama;* and, fifthly, that the antelopes, which are about three or four in number, and which differ from all others by the double flexure of their horns, have alſo been known to the ancients by the names of *ſtrepſicheros*, and of *addax*.

The gazelles are hunted not only with dogs, aſſiſted by the falcon, but alſo, in ſome countries, with the ounce. This animal, tamed for the purpoſe, generally goes with the huntſman; and, when the prey is near, they unchain it, and ſhew it the gazelles. It immediately exerts all its arts and fierceneſs in the purſuit, not, as might be ſuppoſed, by running after them, but by turning and winding about with the utmoſt cunning, till it is near its prey, when it bounds all at once upon the gazelle, ſtrangles it in an inſtant, and ſucks its blood. If it miſſes its aim, which often happens, it reſts in the place, nor does it attempt to purſue them any further; perhaps from the inſtinct, that, as they can run much ſwifter, and a longer time, the chace would be uſeleſs. The maſter then draws near the ounce, coaxing it, and flinging it ſome pieces of fleſh, untill he is near enough to chain, and to bring it back to its former ſtation.

In ſome places, they take wild gazelles by means of a tame one, to the horns of which they faſten a ſnare made of cord. When a herd of gazelles is found, the tame one is ſent among the reſt. It no ſooner approaches, than the males of the wild herd advance to oppoſe him, and, in butting with their horns, are entangled in the nooſe. In this ſtruggle, they both commonly fall to the ground, when the huntſman coming up, kills the one, and diſengages the other.

The antelopes, eſpecially the largeſt ſort, are much more common in Africa than in India. They are ſtronger and fiercer than the other gazelles, from which they are eaſily diſtinguiſhable by the double flexure of their horns: they have alſo no black or brown ſtreaks on their ſides. The middling-ſized antelope is about the ſize and colour of the deer: their horns are very black, their body is very white, and their fore legs ſhorter than the hinder ones. They are well made, and only ſleep in dry and clean places: they are likewiſe very ſwift, very watchful, and very apprehenſive of danger. Hence, in open places, when they ſee a man, a dog, or any other enemy, they fly, with all their ſwiftneſs, till they are out of danger. But, notwithſtanding this natural timidity, they have a kind of courage, if they are ſurpriſed, when they turn ſhort round, and face the enemy that attacks them, with great firmneſs.

The bezoar ſtone is the production not only of gazelles, but of wild and domeſtic goats, and even of ſheep. Probably the formation of this ſtone depends more on the temperature of the climate, and the quality of the food, than on the nature or ſpecies of the animal. Some authors have aſſerted, that the true occidental bezoar, i. e. that which poſſeſſes moſt virtue, is the production of monkeys, and not of gazelles, goats, or ſheep. But this opinion is not founded on a proper baſis; for we have ſeen many of their concretions, to which the name of *monkey bezoar* has been given, quite different from the *Oriental bezoar*, which is certainly produced by a ruminating animal, and which is eaſily diſtinguiſhable from all other bezoars, by its ſhape, ſubſtance, and colour, which is generally of an olive brown without and within. The *occidental* bezoar, on the other hand, is of a pale yellow. The ſubſtance of the firſt is alſo ſofter and finer: that of the laſt, harder and drier. The Oriental bezoar has been prodigiouſly in vogue, and a great conſumption has been made of it in the laſt century. Since it has been made uſe of in Europe and in Aſia too, for all caſes in which our preſent phyſicians give cordial medicines, and other antidotes, may we not preſume, by the great quantities which formerly have been, and by what at preſent is conſumed, that this ſtone is produced not from a ſingle ſpecies of animal, but from many; and that it is equally the production of gazelles, goats, and ſheep, that cannot produce it but in certain climates of the Levant and Indies.

This ſtone is formed, as is well known, by concentrical layers, and often contains ſome foreign matter, even from the circumference to the very center. We have enquired into the nature of this matter, which ſerves as a nucleus to the Oriental bezoar, from which a judgement may be formed of the kind of animal that has ſwallowed them. This nucleus is of various kinds, ſometimes pieces of flint, tamarinds, grains of Caſſia, pieces of ſtraw, and the young buds of trees in particular. From the above facts, therefore we can attribute this production only to thoſe animals which brouze upon ſhrubs and leaves.

Garcias ab Horte ſays, that in Corraſon, and in Perſia, there is a kind of goats called paſans, and that it is in their ſtomachs that the bezoar is formed. Hence in the great number of goats that are killed for the ſubſiſtence of the troops, the ſtones are eagerly ſought after, in the ſtomachs of theſe animals, and very commonly found there.

With reſpect to the occidental bezoars, we can affirm, that they proceed neither from goats nor gazelles, nor even any animal of that kind, in all the extent of the New World. Inſtead of gazelles, we only meet with roe-bucks in the woods of America. Inſtead of wild goats and ſheep, animals of a quite different nature are ſeen on the mountains of Peru and Chili, viz. the lambus, and the pacos.

Mr Daubenton, who has more accurately inveſtigated the nature of bezoar ſtones than any other perſon, thinks that they are compoſed of a matter ſimilar to that which faſtens itſelf to the teeth of ruminating animals, in form of a ſhining tartareous matter.

The chamois, and perhaps the ibex of the Alps, the goats of Guinea, and many other animals of America, furniſh bezoar. But farther, if we comprehend under this name, all concretions of this nature which is met with in different animals, we may be aſſured, the moſt quadrupeds, except carnivorous ones, produce bezoar, which is even to be found in crocodiles and alligators.

To form, therefore, a clear idea of theſe concretions, it will be neceſſary to divide them into many claſſes, and fix them to the animals which produced them, obſerving, at the ſame time, the climate, and the food, which contributed moſt to this kind of production.

1. Then, the ſtones which are found in the bladder, and in the reins of men, and other animals, muſt be held diſtinct from the bezoar claſs, and deſcribed by the name of *calculi*, their ſubſtance being quite different from that of the bezoar. They are eaſily known by their weight, their urinous ſmell, and their compoſition, which is not regular, nor formed with concentrical layers, like that of the bezoar.

2. The concretions that are often found in the gall-bladder, and in the liver of the human ſpecies, and of the brute creation, muſt not be regarded as bezoar ſtones, they being eaſily diſtinguiſhable from them, by their lightneſs, their colour, and their inflammability. Beſides, they are not formed by layers encircled round, or nucleuſes, like the bezoar.

3. The balls that are often found in the ſtomach of animals, and eſpecially in thoſe that ruminate, are not real bezoars. Theſe balls, which are called *egagropiles*, are compoſed internally of the hair the animal has licked off, and ſwallowed, or from the hard roots which he has fed upon, and which he could not digeſt. Their external part is encruſted with a viſcous ſubſtance, ſomewhat ſimilar to that of the bezoar. The *egagropiles*, therefore, have nothing in them, except this external layer, of the bezoar; and a ſingle inſpection is ſufficient to diſtinguiſh the one from the other.

4. *Egagropiles* are often found in the animals of temperate climates, but ſcarcely ever any bezoar. Animals of the hotter countries, on the contrary, only produce bezoar. The elephant, the rhinoceros, the goats, the gazelles of Aſia and Africa, the lama of Peru, and others, produce, inſtead of *egagropiles*, ſolid bezoar, whoſe ſubſtance and ſize varies relatively, according to the difference of the animals and the climates.

5. The bezoar to which the greateſt virtues and properties has been attributed, is the Oriental bezoar, which, as we have ſaid, proceeds from goats, gazelles, and ſheep, which feed on the mountains of Aſia. The bezoar of an inferior quality, and which is called *occidental*, is produced from lamas and pacos, which are to be found in the mountains of South America. In ſhort, the goats and gazelles of Africa alſo produce bezoar, but not of ſo good a quality as thoſe of Aſia.

From all theſe circumſtances, we may conclude, that, in general, the bezoar is only a reſidue of the vegetable nutriment, which is not to be found in carnivorous animals, and which is only produced in thoſe that feed on plants. Beſides in the mountains of Southern Aſia, the herbage being ſtronger than in any other part of the world, the bezoar which is made from the reſidue of that food, has alſo more virtues than any other. In America, where the heat is leſs, the graſs of the mountains weaker, the bezoars produced there, are inferior to the firſt. In Europe too, where the graſs is ſtill weaker, and in all the valleys of both continents, no bezoar is produced, but only *egagropiles*, which contain nothing but hair or roots, and very hard filaments, which the animal was unable to digeſt.

The Bubalus, or Stag-like Antelope.

The name of bubalus has been very improperly applied to the buffalo, of which we have already taken notice in our deſcription of that animal. It belonged formerly only to the animal in queſtion, which is of a nature very different from that of the buffalo. It reſembles the ſtag, the gazelle, and the ox, in many very remarkable reſpects. It is very like the ſtag in the ſize and ſhape of its body and legs; but its horns are permanent, and nearly like thoſe of the largeſt gazelles; which animal it alſo reſembles in its natural habits. Its head, however, is much longer than that of the gazelle, and even than that of the ſtag; and it reſembles the ox, by the length of the muzzle, and the diſpoſition of the bones of the head.

The horns of the bubalus are crooked backwards, and twiſt like a corkſcrew. The ſhoulders are elevated, ſo that they form a ſort of bunch upon the withers. The tail is almoſt a foot long, and furniſhed with a quantity of hair at its extremity.

The hair of the bubalus is like that of the elk, fine towards the root, thick in the middle and extremity. This character is peculiar to theſe two animals; for the hair of almoſt every quadruped is thicker at the root than at the middle and point. The hair is nearly of the ſame colour as that of the elk, though much ſhorter, thinner, and ſofter; and theſe alone are the reſemblances between the bubalus and the elk.

The bubalus is common in Barbary, and in all the northern parts of Africa. It is nearly of the ſame nature as the antelope, and has, like it, ſhort hair, and a black hide, and fleſh which makes very good food.

The Condoma, or ſtriped Antelope.

The Marquis de Marigny ſhewed me, in his cabinet, the head of an animal, which, at firſt I ſuppoſed to have belonged to a great bubalus. It is like thoſe of our largeſt ſtags; but the horns, inſtead of being ſolid like thoſe of the ſtag, are large and hollow, with a ridge like thoſe of the goat kind, and with varied flexures like thoſe of the antelope. In examining the royal cabinet for what might be there relative to this animal, we found two horns which belonged to it. The firſt, without any mark or name, came from his Majeſty's wardrobe. The ſecond was given to me, in 1760, by M. Bauchis, Commiſſionary of the Marines, with the name of the Condoma of the Cape of Good Hope affixed to it. We have thought proper to adopt the laſt name, as the animal which it denotes has never before been deſcribed nor denominated.

The Guib, or Harneſſed Antelope.

In ſearching the narratives of travellers, for thoſe marks which might have an affinity with the remarkable ſize of the horns of this animal, we can find none which have a nearer relation to it than thoſe of the animal indicated by Kolbe, by the name of the *wild goat* of the Cape of Good Hope.—" This goat," he ſays, " to which the Hottentots have not as yet given a name, and which I call the *wild goat*, is very remarkable in many reſpects. It is about the ſize of a large ſtag. Its head is very handſome, ornamented with two crooked and pointed horns, about three feet long, and, at their extremities, about two feet diſtant. All along the back there runs a white ſtripe, which ends at the inſertion of the tail; another, of the ſame colour, croſſes this, at the bottom of the neck, which it entirely ſurrounds. There are two more running round the body, one behind the fore legs, and one parallel to it, before the other. The colour of the reſt of the body is greyiſh, except the belly, which is white. It has alſo a long, grey beard, and its legs, though long, are well proportioned."

The guib, or harneſſed antelope, is an animal which has not been pointed out by any naturaliſt, nor even by any traveller, notwithſtanding it is common enough in Senegal. It reſembles the gazelles, eſpecially the nanguer, in the ſize and ſhape of its body, in the fineneſs of its legs, in the ſhape of its head and muzzle, in the eyes, in the ears and length of its tail, and in the want of a beard; but every gazelle, eſpecially the nanguer, has the colour of the belly white, while the breaſt and belly of the guib is of a deep brown. It alſo differs from the gazelles by the horns, which are ſmooth, and not marked with annular prominences. They are alſo a little compreſſed; and the guib, in theſe particulars, is more like the goat than the gazelle. Notwithſtanding this, it is neither the one nor the other, but of a particular kind, which ſeems to us to be intermediate between the gazelle and the goat. It is alſo remarkable for white ſtripes on a brown ground, which are diſpoſed along the animal's body, as if it were covered with a harneſs. It feeds in company; and they are found in numerous herds in the plains of Pador.

The Grimm.

This animal is only known to naturaliſts by the name of the *wild goat of grimmius;* and, as we are not acquainted with the name it bears in its own country, we cannot do better than adopt this precarious denomination. There are two characters which are ſufficient to diſtinguiſh it. The firſt is a very deep cavity under each eye; the ſecond is a tuft of hair, ſtanding upright on the top of the head. It reſembles both the goat and the gazelle, not only in the ſhape of its body, but even in its horns, which are annulated towards the baſe, and have longitudinal ſtreaks, like thoſe of the gazelles. At the ſame time, they are very ſhort, and bend backwards in an horizontal direction. There is ſome reaſon to think, that the male grimm alone is furniſhed with horns.

The Chevrotins.

We have given the name of *Chevrotin (tragulus)* to thoſe ſmall animals of the hotter countries of Africa and Aſia, which almoſt every traveller has denominated *ſmall ſtags*, or *little hinds*. In fact, the chevrotin is a miniature reſemblance of the ſtag, by the ſhape of its muzzle. the delicacy of its body, the ſhortneſs of its tail, and the ſhape of its legs; but it differs greatly from it in the ſize; the largeſt chevrotins never being found longer than the hare In other reſpects, the horns of thoſe which have any, are hollow, annulated, and nearly reſembling the gazelles. Their foot is cloven, and is alſo more like that of the gazelle than that of the ſtag kind. They differ both from the gazelle and the ſtag, by not having any depreſſions or hollows under their eyes, and in that reſpect approach nearer the goat kind; but, the truth is, they are neither ſtag, gazelle, nor goat, and conſtitute one or more diſtinct ſpecies. Seba gives the figures and the deſcriptions of five chevrotins: the firſt, the *ſmall red Guinea hind, without horns:* the ſecond, the *fawn*, or *ſmall African ſtag:* the third, the *ſmall young ſtag of Guinea:* the fourth, the *ſmall red and white ſpotted hind of Surinam;* the fifth, the *red-haired African*

African ſtag. Of theſe five chevrotins mentioned by Seba, the firſt, ſecond, and third, are evidently the ſame animal: the fifth, which is larger than the three firſt, and whoſe hair is redder, longer, and of a deeper brown, ſeems to us to be only a variety of this ſpecies. The fourth which the author points out as an animal of Surinam, is, according to our opinion, a ſecond variety of this ſpecies, which is only found in Africa, and in the ſouthern parts of Aſia.

Theſe animals are of an elegant make, and finely proportioned for their ſize. But, though they leap and bound with prodigious ſwiftneſs, yet, they do not appear able to continue it for a long time; for the Indians often hunt them down; and the Negroes likewiſe purſue them, and knock them down with their ſticks. They are eagerly ſought for, as their fleſh is excellent food. They can only live in exceſſively hot climates; and they are ſo exceedingly delicate, that it is with the greateſt trouble they are tranſported into Europe alive, where they periſh in a ſhort time. They are eaſily tamed, very familiar, and beautiful. The chevrotin is, without doubt, the leaſt of all cloven-footed animals. According to this character, they ſhould not bring forth many young; but, if we reaſon from their ſmall ſize, we ſhould imagine they brought forth ſeveral at a time. They are exceedingly numerous in the Indies, Java, Ceylon, Senegal, Congo, and in every other country that is exceſſively hot, but they are not to be found in America, nor in any of the temperate climates of the Old Continent.

Mazame.

Mazame, in the Mexican language, was the name of the ſtag, or rather of the whole race of ſtags, deer, and roe-bucks. Travellers diſtinguiſh two kinds of mazames, both common to Mexico and New Spain; the firſt and largeſt, to which they give the ſimple name of mazame, has a horn like that of the roe-buck of Europe, about ſix or ſeven inches long, with the extremity divided into two points. The ſecond, called *temamacame,* is leſs than the former, and has but a ſingle horn, and without any antlers. Theſe two animals ſeem to be roe-bucks; the firſt of which is abſolutely of the ſame ſpecies as the European roe-buck, and the ſecond no more than a variety of it.

The Coudous, or Indian Antelope.

Of all animals thoſe that chew the cud are the moſt numerous, and moſt varied. In the very great quantity of horns collected together in the Royal Cabinet, or diſperſed in private collections, there ſtill remains one without label, without name, and of which we have no other information than what we can procure from the ſubject itſelf. This horn is large, almoſt ſtrait, and very thick and black. It is not ſolid like that of the ſtag, but reſembles that of the ox. After ſearching in a number of different cabinets, we at laſt found, in that of Mr Dupliex, a head adorned with two horns, reſembling the one we juſt now mentioned: this was labelled with theſe words—*The horns of an animal nearly like a horſe, of a greyiſh colour, with a mane before its head: it is called at Pondicherry,* COESDOES, *which ſhould be pronounced* COUDOUS.

The coudous may poſſibly be of the buffalo ſpecies; and the travellers in Africa, where the buffalo is as frequent as in Aſia, more preciſely mention a kind of buffalo, called *pacaſſe* at Congo, which, by the indexes ſeems to us to be the coudous. "In the route from Louanda to the kingdom of Congo, we perceived," ſay they, "two pacaſſes, animals very like buffaloes, and which roar like lions. The male and female go always together. They are white, ſpotted with red and black. Their ears are about half an ell long; and their horns are ſhort. They neither fly at the ſight of the human ſpecies, nor do they do them any injury, but only look at them as they paſs by."

The Muſk Animal.

To finiſh a complete hiſtory of goats, and other animals of this genus, there is only one remaining to be deſcribed, which is as famous as it is unknown. The animal we mean, is that which produces the muſk, which all modern naturaliſts, and the greateſt part of travellers through Aſia have mentioned, ſome by the name of the ſtag, roe-buck, and muſk goat; others have conſidered it as a large chevrotin. It ſeems indeed to be of an ambiguous nature, participating of all the above animals, although, at the ſame time, we can aſſert, that its ſpecies is different from any other. It is about the ſize of a ſmall roe-buck, or gazelle; but its head is without horns; and by this character it reſembles the *memina*, or chevrotin of India. It has two great canine teeth or tuſks in the upper jaw, in which it reſembles the chevrotin; but, what diſtinguiſhes it from all other animals, is a kind of bag, about two or three inches in diameter, which grows near the navel, and in which a liquor filtrates, which differs from civet by its ſmell and conſiſtence. Neither the Greeks nor Romans have made any mention of the muſk-animal; and Grew is the only perſon who has given an exact deſcription of it from its ſkin. The deſcription is as follows:

The muſk ſtag is about three feet ſix inches long, from the head to the tail; and the head is about half a foot; the neck, ſeven or eight inches; the fore part of the head, three inches broad, and like that of the greyhound. The ears are erect, like thoſe of a rabbit, and about three inches long: the tail is not above two inches: the fore legs are about thirteen or fourteen inches high. It is cloven-footed, armed behind and before with two horned ſubſtances; but it has none on the hind feet.

The bladder or bag which contains the muſk is about three inches long, two broad, and projects from the belly about an inch and an half. The animal has twenty ſix teeth. There is alſo a tuſk, or canine tooth, about two inches and an half long, on each ſide in the upper jaw, which terminate in the form of a hook. It has no horns. The hair of this animal is long and rough, the muzzle pointed, and tuſks that are ſomewhat like thoſe of the hog By theſe marks it reſembles the boar kind, and perhaps ſtill more that of the *babirouſſa*, which the naturaliſts have denominated the *Indian boar*. The American hog alſo, which we call *pecari*, has a bag or cavity on its back, containing a great deal of a very odoriferous humour. In general, thoſe animals which produce odoriferous liquors, as the badger, the caſtor, the pecari, the oudatra, the derman, the civet, the zibet, are not of the ſtag or goat kind. Hence we might be induced to think, that the muſk animal is nearer the hog ſpecies than that of the goat.

In reſpect to the matter of muſk itſelf, its eſſence is perhaps as little known as the nature of the animal which produces it. All travellers agree, that the muſk is always mixed and adulterated with blood, or ſome other drugs, by thoſe who ſell it. The Chineſe not only increaſe the quantity by this mixture, but they endeavour likewiſe to increaſe the weight, by incorporating with it lead very finely ground. The pureſt and the beſt muſk, is that which the animal depoſits upon trees or ſtones, againſt which it rubs itſelf when the quantity renders it uneaſy. The muſk which is brought over in the bag, is very ſeldom ſo good, becauſe it is not ripe, or becauſe it is only in their rutting ſeaſon that it acquires all its ſtrength and all its ſmell. It is at this time too that the animal endeavours to diſburthen itſelf of this pure matter, which then occaſions ſuch violent itchings and irritations. A ſingle grain of muſk is ſufficient to perfume a great deal of other matter; and the odour expands itſelf to a very great diſtance. The ſmalleſt particle is ſufficient to perfume a conſiderable ſpace; and the perfume itſelf is ſo permanent, that, at the end of ſeveral years, it does not ſeem to have loſt much of its power.

CHAP. XIX.

OF THE BABIROUSSA, OR INDIAN HOG—THE CABIAI—THE PORCUPINE—THE COUANDO—THE URSON—THE ASIATIC HEDGE-HOG—THE CAMELEOPARD—THE LAMA, AND PACO.—THE SLOTH—THE SURICAT—THE TARSIER—THE PHALANGER—THE COQUALLIN—THE HAMSTER—THE BOBAK—THE JERBOA—THE ICHNEUMON—THE FOSSAN—THE TANSIRE—THE MAKI, OR MAUCACAU—THE LORI—THE JAVELIN BAT.

The Babirouſſa, or Indian Hog.

ALL naturaliſts have conſidered this animal as a kind of hog, though it has neither the head, ſhape, briſtles, nor tail of a hog. Its legs are longer, and its muzzle ſhorter. It is covered with ſoft and ſhort hair like wool. Its body is likewiſe not ſo thick and clumſy as that of the hog: its hair is grey, mixed with red and a little black: its ears are ſhort and pointed; but what diſtinguiſhes it from all other animals, are four enormous tuſks, or canine teeth, the two ſhorteſt of which ſhoot out of the lower jaw, like thoſe of the boar. The other two, which come from the upper jaw, pierce the cheeks, or rather the upper part of the lips, and riſe crooked almoſt to the eyes. Theſe tuſks are of a very beautiful ivory, much ſmoother and finer, but not ſo hard as thoſe of the elephant.

Theſe quadruple and enormous tuſks, give theſe animals a very formidable appearance; they are, however, leſs dangerous than our wild boars. Like them they herd together; and they have a very ſtrong ſmell, by which they are eaſily diſcovered, and hunted with ſucceſs. They grunt terribly, defend themſelves, and wound their enemy with their under tuſks; for the upper are of no uſe to them. Although wild and ferocious as the boar, they are tamed with great eaſe; and their fleſh, which is very good food, putrefies in a very ſhort time. As their hair is fine, and their ſkin delicate, it is ſoon penetrated by the teeth of the dogs, who hunt them in preference to wild boars. The babirouſſa ſtrikes its upper tuſks into the branches of trees, to reſt its head, or to ſleep ſtanding. This habit it has in common with the elephant,

phant, who, in order to ſleep in an erect poſture, ſupports its head by fixing the end of its tuſks in the holes which he makes in his lodging."

The babirouſſa differs ſtill more from the wild boar by its natural appetites. It feeds upon graſs and leaves of trees, and does not endeavour to enter gardens, to feed on beans, peaſe, and other vegetables; while the wild boar, who lives in the ſame country, feeds upon wild fruits, roots, and often on the booty it carries off from gardens. Theſe animals that go alike in herds never mix: the wild boars keep on one ſide, and the babirouſſas on the other: theſe walk quicker, and have a very fine ſmell. They often fix themſelves againſt a tree, to keep off the hunters and their dogs. When they are purſued, they make towards the ſea, and, ſwimming with great dexterity, very often eſcape; for they often ſwim from one iſland to another.

The babirouſſa is found not only in the iſland of Bouro, or Boero, near Amboyna, but alſo in many parts of Southern Aſia and Africa; as at Eſtrila, Senegal, Madagaſcar, &c. We have not had it in our power to convince ourſelves, that the female had not the two tuſks which are ſo remarkable in the male; but moſt authors, who have taken notice of this animal, ſeem to agree in this circumſtance.

The Cabiai.

This American animal has never yet made its appearance in England. It is not a hog, as naturaliſts and travellers pretend: it even reſembles it only by trifling marks, and differs from it by ſtriking characters. The largeſt cabiai is ſcarcely the ſize of a hog of eighteen months growth. The head is longer; the eyes are larger; the ſnout, inſtead of being rounded, as in the hog, is ſplit like that of a rabbit or hare, and furniſhed with thick, ſtrong whiſkers. The mouth is not ſo wide: the number and form of the teeth are different; for it is without tuſks. Like the peccary, it wants a tail, and, unlike to all others of this kind, is in a manner web-footed, and thus eaſily fitted for ſwimming and living in water. The hoofs before are divided into four parts, and thoſe behind into three: between the diviſions, there is a prolongation of the ſkin. Hence the feet, when opened in ſwimming, can beat a greater ſurface of water.

This animal, ſwims in the water, like a badger, ſeeks the ſame prey, ſeizes the fiſh with its feet and teeth, and carries them to the edge of the lake, to devour them with the greater eaſe. It lives alſo upon fruits, corn, and ſugar-canes. As its legs are broad and flat, it often ſits upon its hind-legs. Its cry reſembles more the braying of an aſs than the grunting of an hog. It ſeldom ſtirs out but at night, and almoſt always in company, without going far from the ſides of the water. It can find no ſafety by flight; and, in order to eſcape its enemies which purſue it, it plunges into the water, remains at the bottom a long time, and riſes at ſuch a great diſtance, that the huntſmen loſe all hopes of ſeeing it again. It is fat; and the fleſh is tender, but, like that of the badger, rather of a fiſhy taſte. The head, however, is not bad; and this agrees with what is ſaid of the beaver, whoſe exterior parts have a taſte like fiſh.

The cabiai is quiet and gentle. It is eaſily tamed, and willingly follows the hand that feeds it. We do not know the time of their bringing forth their young; nor their growth, and conſequently the length of life of this animal. They are very common in Guiana, as well as in Braſil, in Amazonia, and in all the lower countries of South America.

The Porcupine.

The name of this animal makes many imagine, that it is only a hog covered with quills, when, in fact, it only reſembles that animal by its grunting. In every other reſpect, it differs from the hog as much as any other animal, as well in external appearance, as in the interior conformation. Inſtead of a long head and ears, armed with tuſks, and terminated with a ſnout. Inſtead of a cloven foot, furniſhed with hoofs like the hog, the porcupine has a ſhort head like that of the beaver, with two large inciſive teeth in the fore part of each jaw. It has no tuſks, nor canine teeth. Its muzzle is divided like that of the hare. Its ears are round and flat, and the feet armed with nails. Inſtead of a large ſtomach with an appendix in form of a caul, the porcupine has only a ſingle ſtomach, with the large cœcum gut. The parts of generation do not appear externally, as in the male hog. Its teſticles, and the other parts of generation, are likewiſe concealed in the body. By all theſe marks, as well as by its ſhort tail, its long whiſkers, and its divided lip, it participates more of the hare, or beaver kind, than that of the hog. The hedge-hog, indeed, which is, like the porcupine, covered with prickles, is ſomewhat reſembling the hog; for it has a long muzzle, terminated by a kind of ſnout. All theſe reſemblances however, being very diſtant, it ſeems that the porcupine is a different ſpecies from that of the hedge-hog, the beaver, the hare, or any other animal with which it may be compared.

Travellers and naturaliſts have almoſt unanimouſly agreed, that this animal has the faculty of diſcharging its quills, and wounding its foes at an immenſe diſtance. They add that theſe quills have the peculiar property of penetrating into the fleſh, as ſoon as the point has made an entrance through the ſkin. Theſe ſtories, however, are all purely imaginary, and without the ſmalleſt foundation. The error ſeems to have ariſen from this animal raiſing his prickles erect, when he is irritated; and, as there are ſome of them which are only inſerted into the ſkin by a ſmall pellicle, they eaſily fall off. We have ſeen many porcupines, but have never obſerved them dart any of their quills from them, although they were violently agitated. We cannot, therefore but be much aſtoniſhed, that the greateſt authors, both modern and ancient, as well as the moſt judicious travellers, have ſubſcribed to a circumſtance ſo entirely falſe. In juſtice, however, to Dr Shaw, we muſt except him from the number of theſe credulous travellers: “ Of all the number of porcupines,” ſays he, “ which I have ſeen in Africa, I have never yet met with one which darts its quills, however ſtrongly it was irritated. Their common method of defence is to lie on one ſide, and when the enemy comes in to cloſe quarters, to riſe ſuddenly, and wound him with the points of the other.

The porcupine, although a native of the hotteſt climate of Africa and India, lives and multiplies in colder countries, ſuch as Perſia, Spain, and Italy. Agricola ſays, that the ſpecies was not tranſported into Europe before the laſt century. They are found in Spain, but more frequently in Italy, eſpecially on the Appenine mountains and in the environs of Rome.

The porcupine, in its domeſtic ſtate, is neither furious nor vicious. It is only anxious for its liberty; and, with the aſſiſtance of its fore-teeth, which are ſharp and ſtrong, like thoſe of the beaver, it eaſily breaks through a wooden priſon. It is alſo known, that it feeds willingly on fruits, cheſnuts, and crumbs of bread; that, in its wild ſtate, it lives upon roots and wild grain; that, when it can enter a garden, it makes great havock, upon the herbs, roots, fruits, &c. It becomes fat, like moſt other animals, towards the end of ſummer; and its fleſh, although inſipid, is tolerably palatable.

When the form, ſubſtance, and organization of the prickles of the porcupine are conſidered, they are found to be true quills, to which only feathers are wanting to make them exactly reſemble thoſe of birds. They ſtrike together with a noiſe as the animal walks; and it eaſily erects them in the ſame manner as the peacock ſpreads the feathers of his tail.

The Couando, or Brazillian Porcupine.

The porcupine, is a native of the hot countries of the Old World; but, notwithſtadding it has not been found in the New, travellers have given its name to animals which ſeem to reſemble it, and particularly to that of which we are about to take notice. On the other hand, the Couando of America has been tranſported to the Eaſt Indies; and Piſon, who probably was not acquainted with the porcupine, has engraved in Bontius the couando of America, under the name and deſcription of the true porcupine. The couando, however, is not a porcupine, it is far leſs: its head and muzzle is ſhorter: it has no tuft on its head, nor ſlit in the upper lip: its quills are ſometimes ſhorter and much finer: its tail is long, and that of the porcupine is very ſhort. In a word, it is rather carnivorous, whilſt the porcupine is only frugivorous. It ſleeps all the day like the hedge-hog, and only ſtirs out in the night: it climbs up trees, and hangs in the branches by its tail, which the porcupine cannot do. All travellers agree, that its fleſh is very palatable. It is eaſily tamed, and commonly lives in high places. Theſe animaals are found over all America, from Braſil and Guiana, to Louiſiania and the ſouthern parts of Canada; while the porcupine is only to be met with in the hotteſt parts of the Old Continent.

In transferring the name of porcupine to the couando, they have ſuppoſed and tranſmitted to him the ſame faculties, eſpecially that of lancing its quills. Ray is the only perſon who has denied theſe circumſtances, although they appear, at firſt view, to be abſurd.

The Urſon, or Canada Porcupine.

This animal, placed by Nature in the deſart part of North America, exiſts independent of, and far diſtant from, man. The *urſon* might be called the *ſpiny beaver*, it being of the ſame ſize, the ſame country, and the ſame form of body. It has, like that, two long, ſtrong, and ſharp inciſive teeth at the end of each jaw: its prickles are ſhort, and almoſt covered with its hair; for the urſon, like the beaver, has a double coat. The firſt conſiſts of long and ſoft hair, and the ſecond of a down, or felt, which is ſtill ſofter and ſmoother. In the young urſons, the prickles are proportionably larger, more apparent, and the hair ſhorter and ſcarcer than in the adults.

This animal diſlikes water, and is fearful of wetting itſelf. He makes his habitation under the roots of great hollow trees, ſleeps very much, and chiefly feeds upon the bark of juniper. In winter, the ſnow ſerves him for drink; in ſummer, he laps water like a dog. The ſavages eat his fleſh, and ſtrip the briſtles off the hide, which they uſe inſtead of pins and needles.

The Tanrec, and Tendrac, or Aſiatic Hedge-Hogs.

The Tanrec, and Tendrac, or Aſiatic Hedge-hogs, are two ſmall animals of the Eaſt Indies, which ſomewhat reſemble our hedge-hog, but are ſufficiently different to conſtitute a different ſpecies. What ſtrongly proves this, is, their not rolling themſelves up in the ſhape of a ball, like the hedge hog; and where the tanrecs are found, as at Madagaſcar, hedge-hogs are alſo to be met with of the ſame ſpecies with ours.

There appear to be tanrecs of two ſpecies, or perhaps of two different breeds. The firſt, which is nearly as large as our hedge-hog, has its muzzle proportionably longer. Its ears too are more apparent, and leſs furniſhed with prickles, than thoſe of the ſecond, to which we have given the name of tendrac, to diſtinguiſh it from the reſt. The tendrac is not larger then a rat: its muzzle and its ears are ſhorter than thoſe of the tanrec; which laſt is covered with ſhorter prickles, as numerous as thoſe of the hedge-hog. The tendrac on the other hand has them only on the head, neck and ſhoulders; the reſt of the body being covered with a coarſe hair, not unlike the briſtles of an hog.

Theſe little animals, whoſe legs are ſmall, move but ſlowly: they grunt like an hog, and wallow, like it, in mire: they are for the moſt part in creeks and harbours of ſalt water: they multiply in great numbers, and make themſelves holes in the ground, and ſleep for ſeveral months. During this torpid ſtate, their hair falls off, which is renewed upon their revival. They are uſually very fat; and although their fleſh be inſipid, ſoft and ſpongy, yet the Indians conſider it as a very great delicacy.

The Cameleopard.

The cameleopard is one of the talleſt, moſt beautiful, and moſt harmleſs of animals. The enormous diſproportion of its legs (the fore legs being as long again as the hinder ones) is a great obſtacle to the uſe of its ſtrength. Its motion is waddling and ſtiff: and it can neither fly from its enemies in its free ſtate, nor ſerve its maſter in a domeſtic one. The ſpecies is not very numerous, and have always been confined to to the deſarts of Ethiopia, and ſome other provinces of Africa and India. As theſe countries were unknown to the Greeks, Ariſtotle makes no mention of this animal; but Pliny ſpeaks of it, and Oppian deſcribes it thus. "The cameleopard," ſays this author, "has ſome reſemblance to the camel: its head and ears are ſmall, its feet broad, and its legs long; but the height of the laſt is very unequal, the fore legs being much longer than the hinder, which are very ſhort. Hence, when the animal appears ſtanding and at reſt, it is not unlike a dog ſitting. There are two prominences upon the head, juſt between the ears, which reſemble two ſmall and ſtrait horns. Its mouth is like the ſtag's; its teeth ſmall and white: its eyes are full of fire: its tail is ſhort, and furniſhed with black hairs at the end."

"There is," ſays Strabo, "a large beaſt in Ethiopia, called *camelopardalis;* although it bears no reſemblance to the panther, for its ſkin is not ſpotted in the ſame manner. The ſpots of the panther are orbicular,

cular, and thoſe of this animal are long, and nearly reſemble thoſe of the fawn, or young ſtag." Gillius's deſcription ſeems to me ſtill better: "I have ſeen," ſays he, "three cameleopards at Cairo. On their heads are two horns, ſix inches long; and, in the middle of their forehead, a tubercle riſes to about two inches high, which appears like a third horn. This animal is ſixteen feet high when he holds his head erect. Its neck alone is ſeven feet: and it is twenty feet long, from the tip of the noſe to the end of the tail. Its fore and hind legs are nearly of an equal height; but the thighs before, are ſo long in compariſon to thoſe behind, that its back ſeems to ſlope like the roof of an houſe. Its whole body is ſpeckled with large brown ſpots, which are nearly of the ſame form. Its feet are cloven like thoſe of the ox."

In comparing the accounts travellers have given of the cameleopard, I find a tolerable agreement between them. They all agree, that it can reach with its head to the height of ſixteen or ſeventeen feet, when ſtanding erect; and that the fore legs are twice as high as the hinder ones; ſo that it ſeems as if it were ſeated upon its crupper. They all likewiſe agree, that they cannot run very ſwift, on account of this diſproportion that they are very gentle, and that by this quality, and even by the ſhape of the body, it partakes more of the ſhape and nature of the camel than of any other animal. They add too that it is among the number of ruminating animals, and, like them, is deficient of the inciſive teeth in its upper jaw. From the authority of ſome, we find, that cameleopard is to be met with in the ſouthern parts of Africa, as well as in thoſe of Aſia.

It is very clear from what we have mentioned, that that the cameleopard is a very different ſpecies from every other animal, but, if we referred it to any, it would be to that of the camel, rather than to that of the ſtag.

We are ignorant of the ſubſtance of the horns of the cameleopard; and in that part it may reſemble the ſtag more than the ox, though poſſibly they may be neither ſolid, like thoſe of the firſt, nor hollow, like thoſe of the ox, goat, &c. They may be compoſed of united hairs, like thoſe of the rhinoceros, or of a ſubſtance and texture entirely peculiar to themſelves. The horns of the cameleopard are ſurrounded with large, coarſe hair, and not covered with a down or velvet, like thoſe of the ſtag. This circumſtance might incline us to ſuppoſe they were compoſed of united hair, nearly like thoſe of the rhinoceros. The tubercle in the middle of the head ſeems to form a third horn, and is another ſtrong circumſtance in favour of this opinion. The other two which are not pointed, but have moſſy knobs at their ends, are perhaps only tubercles not unlike the former. Travellers inform us, that the female cameleopards have horns like the males, with this difference only, that they are ſmaller. If this animal, therefore, were of the ſtag kind, the analogy would be violated here likewiſe; for, of all ſuch animals, only the female rein-deer has horns.

The Lama, and the Paco.

There are examples, in every language, of two different names being appropriated to the ſame animal; one of which has a relation to its wild, and the other to its domeſtic ſtate. The wild boar and the hog are the ſame animal, under two names, which relate only to the condition of the ſpecies, of which one part is under the power of man, and the other independent of him. It is the ſame with reſpect to the lamas and the pacos, which were the only domeſtic animals of the ancient Americans. Theſe names, then, belong to their domeſtic ſtate. The wild lama is called *huanacus*, or *guanaco;* and the wild paco, *vicunna*, or *vigogne*. I thought this remark neceſſary to avoid the confuſion of names. Theſe animals are not to be found in the Old Continent, but only belong to the New. They ſeem even to belong to ſome particular parts, beyond the limits of which they are never to be ſeen. They appear attached to the chain of mountains which ſtretch from New Spain to the Streights of Magellan: they inhabit the higheſt regions of the globe, and ſeem to require a purer and more rarified air than that of our higheſt mountains.

It is very ſingular, that, although the lama and the paco are domeſticated in Peru, Mexico and Chili, as the horſes are in Europe, or the camels in Arabia, we are almoſt ſtrangers to them. Peru, according to Gregory de Bolivar, is the true and native country of the lamas. They are conducted indeed into other provinces, as New Spain, &c. but this is rather for curioſity than utility; but in Peru, from Potoſi to Curacas, they abound, and conſtitute the chief riches of the Indians and Spaniards, who rear them. Their fleſh is excellent food: their hair, or rather wool, may be ſpun into beautiful clothing; and they are capable of carrying heavy loads in the moſt rugged and dangerous ways. The ſtrongeſt of them will travel with two hundred, or two hundred and fifty pounds weight on their backs. Notwithſtanding their pace is but ſlow, and their journey is ſeldom above fifteen miles a day, they deſcend precipices, and find footing among the moſt craggy rocks, where even men can ſcarcely accompany them. They commonly travel for five days together, after which they reſt, for two or three days. They are chiefly employed in carrying the riches of the mines of Potoſi. Bolivar affirms, that, in his time, above three hundred thouſand of theſe animals were in actual employ.

The growth of the lama is very quick; and its life is but ſhort. This animal couples at three years of age, and remains ſtrong and vigorous till twelve; after which it begins to decline, and becomes entirely uſeleſs at fifteen. Their nature appears modelled on that of the Americans. They are gentle and phlegmatic, and do every thing with the greateſt leiſure and caution. When they ſtop on their journeys, they bend their knees very cautiouſly, in order to lower their bodies without diſordering their load. As ſoon as they hear their driver whiſtle, they riſe up with the ſame precaution, and proceed on their journey. They feed as they go along on the graſs they meet with in their way, but never eat in the night, making uſe of that time to ruminate. The lama ſleeps, like the camel, with its feet folded under its belly, and ruminates in that poſture. When overloaded or fatigued, it falls on its belly, and will not riſe, though its driver ſtrikes it with his utmoſt force.

The lama is about four feet high: its body, comprehending the neck and head, is five or ſix feet long: its neck alone is near three feet. The head is ſmall and well proportioned, the eyes large, the noſe ſomewhat long, the lips thick, the upper divided, and the lower a little depending. It wants the inciſive and canine teeth in the upper jaw. The ears are four inches long, and move with great agility. The tail is ſeldom above eight inches long, ſmall, ſtrait, and a little turned up at the end. It is cloven footed, like the ox; but the hoof has a kind of ſpear like appendage behind, which aſſiſts the animal to move and ſupport itſelf over precipices and rugged ways. The back, the crupper, and the tail, are clothed with ſhort wool; but it is very long on the belly and ſides. Theſe animals differ in colour; ſome are white, others black, but moſt of them are brown.

Theſe uſeful, and even neceſſary animals, are attended with no expence to their maſters; for, as they are cloven-footed, they do not need to be ſhod, nor do they require any ſhelter from the inclemency of the weather, as their wool ſupplies them with a warm covering. Satisfied with a ſmall portion of vegetables and graſs, they ſtand in need of neither corn nor hay; they are ſtill more moderate in what they drink, as their mouths are continually moiſtened with ſaliva, which they have in a greater quantity than any other animal. The natives hunt the huanacus, or wild lama, for the ſake of its fleece. The dogs have much trouble to follow them; and, if they do not come up with them before they gain the rocks, both the huntſmen and the dogs are obliged to give up their purſuit.

The pacos are a ſubordinate kind to the lamas, much in the ſame proportion as the aſs is to the horſe. They are ſmaller, and not ſo ſerviceable; but their fleece is more uſeful. Their wool is fine and long, and is a ſort of merchandiſe, as valuable as ſilk. The natural colour of the pacos is that of a dried roſe-leaf, which is ſo fixed, that it undergoes no alteration in the hands of the manufacturer. Gloves, ſtockings, quilts, and carpets, are manufactured of this wool, which far exceed thoſe of the Levant.

The pacos alſo reſemble the lamas in their form, except that their legs are ſhorter, and their muzzle thicker and cloſer. They inhabit and climb over the higheſt parts of the mountains. The ſnow and ice ſeem rather agreeable to them than otherwiſe. When wild, they keep together in flocks, and run very ſwift; but, as ſoon as they perceive a ſtranger, they take flight, and drive their young before them. The ancient monarchs of Peru rigorouſly prohibited the hunting of them, as they multiply ſlowly; but, ſince the arrival of the Spaniards in theſe parts, their number is greatly decreaſed. The fleſh of theſe animals is not ſo good as that of the huanacus; and they are only ſought after for their fleece, and the bezoar they produce. The method of taking them, proves their extreme timidity, or rather their weakneſs. The huntſmen having driven the flock into a narrow paſſage, acroſs which they have ſtretched a rope about four feet from the ground, with a number of pieces of linen or cloth hanging on it, the animals are ſo intimidated at theſe rags agitated by the wind, that they ſtop, and, crowding together in a heap, large numbers of them are killed with the greateſt eaſe. If there are any huanacus, however, among the flock, which are leſs timid than the pacos, they leap over the rope with great agility. The example is immediately followed by the whole flock, and they elude the ſtratagem of their purſuers.

With reſpect to the domeſtic pacos, they are accuſtomed to carry burdens, like the lamas; but, being ſmaller and weaker, they carry much leſs weight. They are likewiſe of a more ſtubborn nature; and, when once they reſt with their load, they will ſuffer themſelves to be cut to pieces ſooner than riſe. The Indians have never made uſe of the milk of theſe animals, as they have ſcarcely enough to ſupply their young. The great profit derived from their wool, has induced the Spaniards to endeavour to naturalize them in Europe. They have tranſported them into Spain, in hopes to raiſe the breed in that country; but, the climate not agreeing with their nature, none of them lived. I am perſwaded, however, that theſe animals, which are more valuable than the lamas, might thrive upon our mountains, eſpecially upon the Pyrenean. Thoſe who brought them into Spain, did not conſider that they can exiſt, even in Peru, only in the cold regions; that is, on the top of the higheſt mountains; that they are never to be found in the valley, and die, if brought into hot countries. Conſequently, in order to preſerve them, they ſhould be landed, not in Spain, but in Scotland, and even in Norway, and with greater certainty at the foot of the Pyrenean, Alpine, or other mountains, where they might climb and attain to the region which is moſt conſentaneous to their nature.

The Unan, and the Ai.

These two animals have the epithet of *ſloth* given to them both, by moſt authors, on account of the ſlowneſs of their walk. The unan has no tail, and only two nails on the fore feet. The ai has a ſhort tail, and three nails on every foot. The noſe of the unan is likewiſe much longer, the forehead higher, and the ears longer than the ai. It differs alſo in the hair. As for the internal parts, its viſcera are both formed and ſituated different; but the moſt diſtinctive, and, at the ſame time, the moſt ſingular character, is, that the unan has forty-ſix ribs, while the ai has but twenty-eight. This alone ſuppoſes two ſpecies, quite diſtinct one from the other; and theſe forty-ſix ribs, in an animal whoſe body is ſo ſhort, is a kind of a prodigy in nature; for, even in the largeſt animals, and thoſe whoſe bodies are relatively longer than they are thick, none of them is found to have ſo many. The elephant has only forty ribs, the horſe thirty.ſix, the ram thirty, the dog twenty-ſix, and the human ſpecies twenty-four, &c. This difference in the conſtruction of the unan and the ai, ſuppoſes a greater diſtance between theſe two kinds than there is between that of the cat and the dog, which have the ſame number of ribs. Now the external differences are nothing in compariſon with the internal ones, which are the cauſes of the others. Theſe animals have neither inciſive nor canine teeth: their eyes are dull and heavy: their mouths wide and thick: their fur coarſe and ſtaring, and like dried graſs: their thighs ſeem almoſt disjointed from the haunch: their legs are very ſhort, and badly ſhaped. They have no ſoles on the feet, nor toes ſeparately moveable, but only two or three claws, exceſſively long, and crooked downwards and backwards. Deſtitute of teeth, they cannot ſeize any prey, nor feed upon fleſh, nor even upon vegetable food. Reduced to live on leaves and wild fruits, they take up a long time in crawling to a tree, and are ſtill longer in climbing up to the branches. During this ſlow and painful labour, which ſometimes laſts many days, they are obliged to ſupport the moſt preſſing hunger. When, at length, one of them has accompliſhed its end, it faſtens itſelf to the tree, crawls from branch to branch, and, by degrees, ſtrips the whole tree of its foliage. In this manner, it remains ſeveral weeks without moiſtening its dry food with any liquid; and, when it has conſumed its ſtore, and the tree is entirely naked, yet unable to deſcend, it continues on it till hunger preſſes, and that becoming more powerful than the fear of danger or death, it drops to the ground, without being capable of exerting any effort to break the violence of its fall.

On the ground, theſe animals are expoſed to all their enemies; and, as their fleſh is not abſolutely bad, they are devoured by men, and beaſts of prey. They ſeem to multiply but little, or, if they produce very often, it is only a ſmall number, as they are furniſhed but with two teats. Hence every thing concurs to their deſtruction, and the ſpecies ſupports itſelf with great difficulty. It is true, that, although they are ſlow, heavy and almoſt incapable of motion, yet they are hardy, ſtrong, and can abſtain a long time from food. Covered with a thick and coarſe fur, and ſcarcely able to move, they waſte but little, and fatten by reſt, however ſcanty their food be. Although they have neither horns on their heads, nor hoofs to their feet, nor inciſive teeth in the lower jaw, they are, notwithſtanding, among the number of ruminating animals, and have, like them, four ſtomachs. Hence they can compenſate for the quality of their food, by the quantity they take at a time; and, what is ſtill more ſingular is, that, inſtead of having, like other ruminating animals, inteſtines very long, theirs are very ſhort, like thoſe of the carnivorous kind.

Both theſe animals belong to the ſouthern parts of the New Continent, and are never to be met with in the Old. The unan, as well as the ai, is to be met with in the deſarts of America, from Braſil to Mexico; but they have never inhabited the northern countries. They can endure neither cold nor rain: the change from wet to dry, deſtroys their fur, which then reſembles badly dreſſed hemp, rather than wool or hair.

The Surikat.

This animal is a native of Surinam, and the other provinces of South America. It is very lively and ſubtle: it ſometimes walks on its hinder legs, and often ſits upright on them, with its fore paws hanging down by the ſide of its body. Its head is then erect, and moves upon the neck as on a pivot. It is not ſo big as a rabbit, and nearly reſembles the marmoſe in ſize: its tail is ſomewhat longer, and its ſnout is more prominent and raiſed. It is more like the coati than any other animal. Its character likewiſe is nearly original, ſince it neither belongs to the coati, nor to the hyæna. Theſe two are the only animals who have four toes on each foot.

This animals eats raw meat, and particularly poultry with a reliſh. It is fond of fiſh, and ſtill more of eggs. It will eat neither fruit nor bread. It makes uſe of its fore feet, like the ſquirrel, to convey its food to its mouth. It laps its drink like a dog, and will not touch water, unleſs it be luke-warm. Of one which I had in my poſſeſſion, its common drink was its own urine. It did not chew its food, but often ſcratched the brick or plaiſtered walls with its nails. It was ſo well tamed, that it anſwered to its name, when called: it went about the houſe like a cat, and had two voices; one like the barking of a young dog, when it was left long alone, or heard an unuſual noiſe. On the contrary, when it was careſſed, or when it ſhewed ſome mark of pleaſure, it made a noiſe as ſtrong as that of a rattle ſmartly turned. It was a female animal, and only lived one winter, notwithſtanding all the tender care taken of it.

The Tarſier.

The Tarſier is an animal remarkable for the length of its hind legs. The bones of the feet, and eſpecially thoſe which compoſe the upper part of the tarſus, are of an extraordinary ſize. It has five toes to every foot; it has, as I may ſay, four hands; for the toes are very long, and ſufficiently divided. The largeſt of thoſe behind, or the thumb, is terminated by a flat claw; and, although the claws of the other toes are pointed, they are, at the ſame time, ſo ſhort and ſmall, they do not prevent the animal from uſing its fore feet like hands. The jerboa, on the contrary, has only four toes, and four long and crooked claws, on its fore feet; and, inſtead of a thumb, it has nothing but a tubercle without any claw. What, however, removes it farther from our tarſier, is that it has only three fingers, or three great claws, in the hind feet.

The Phalanger.

Theſe animals, which have been ſent to us by the name of *Surinam rats*, have much leſs affinity with rats, than with the animals of the ſame climate of which we have given the hiſtory, under the names of the *marmoſe*, and *cayopoline.* As it has never been named by any artiſt or traveller, we have denominated it from its character, which is totally different from that of any other animal, and have called it *phalanger*, from its *phalanges* being ſingularly formed, and becauſe its two fore toes are conjoined in ſuch a manner, that this double toe appears like a hoof, ſeparated only near the claws. The thumb is ſeparated from the fingers, and has no claw at its extremity.

Theſe animals vary in the colour of the hair. They are about the ſize of a ſmall rabbit, or a very large rat, and are remarkable for the exceſſive length of their tail, ſnout, and the form of their teeth, which alone is ſufficient to diſtinguiſh the phalanger from the marmoſe, the ſariga, the rat, and every other ſpecies of animals with which it may be ſuppoſed to have any affinity.

The Coquallin.

This animal was ſent from America, by the name of the *oringe-coloured ſquirrel.* It is, however, not a ſquirrel, although ſufficiently reſembling it by the ſhape of the tail; for it not only differs by many external characters, but alſo by its nature and manners.

The coquallin is much larger than the ſquirrel. It is a beautiful animal, and very remarkable for its colours, its belly being of a fine yellow, and its head, as well as body, varied with white, black, brown, and orange. It covers its back with its tail, like the ſquirrel, but has not, like that animal, ſmall bruſhes of hair at the tips of the ears. It never climbs up any trees, and dwells in the hollows and under the roots of trees, like the animal we have termed *ſuiſſe.* In ſuch places, it builds its neſt, and rears up its young. It likewiſe ſtores its little habitation with corn and fruit, to feed on during the winter: it is a jealous and cunning animal, and ſo exceedingly wild, that it is impoſſible to be tamed.

The coquallin is only found in the ſouthern parts of America. The white and orange-coloured ſquirrels of the Eaſt Indies are much ſmaller, and their colours are uniform. Theſe are true ſquirrels which climb up trees, and produce their young on them. The coquallin, and the American ſuiſſe, burrow on the other hand, under the ground, like rabbits, and have no other affinity with the ſquirrel, than a reſemblance in the external form.

The Hamſter, or German Marmot.

The Hamſter, or German Marmot, is one of the moſt famous, and moſt pernicious rats that exiſt. We have fed one of theſe animals for many months, and afterwards had it diſſected, and obſerved, that the hamſter was more like the water-rat, than any other animal. It reſembled it in the ſmallneſs of its eyes, and the fineneſs of its hair; but its tail is not ſo long as that of a water rat; but, on the contrary, it is much ſhorter than that of the ſhort-tailed mouſe. All theſe animals live under the earth, and ſeem to be animated with the ſame inſtinct: they have nearly the ſame habits, and particularly that of collecting corn, &c. and making great magazines in their holes.

The habitations of the hamſters are different, according to the ſex, the age, and alſo the quality of the land they inhabit. That of the male hamſter is an oblique paſſage, at the entrance of which is a portion of earth thrown up. At a diſtance from this entrance, there is a ſingle hole, which deſcends in a perpendicular manner to the chambers, or cavities, of the habitation. There is no hillock of earth near that hole; which makes us preſume, that the oblique entrance is made hollow from the outſide, and that the perpendicular hole, by which they come out, is worked within from the bottom to the top.

The habitation of the female has alſo an oblique paſſage, with two, three, and even eight perpendicnlar holes, by which the young ones may go in and out, at pleaſure. The male and the female have each their ſeparate abode; but that of the female is deeper than that of the male.

The perpendicular hole is the common paſſage for coming in and going out. By the oblique tour, they throw out the earth they ſcratch up. This paſſage alſo has a gentle declivity into ſome of the cavities, and a ſteeper into others, which ſerves for a free circulation of the air in this ſubterraneous habitation. The cavity where the female breeds her young, contains no proviſion, but only a neſt of ſtraw, or graſs. The depth of the cavity is very different. The young hamſter, of a year old, makes its burrow only a foot deep, while the old animal often hollows it to the depth of four or five feet. All the cavities communicate together in one habitation, which is about eight or ten feet diameter.

Theſe animals ſtore their magazines with dry clover, corn, and other grain. They alſo provide themſelves with beans and peaſe. They are particularly careful to ſeparate all theſe from the huſk, which, with whatever elſe they do not make uſe of, they carry out of their habitation by their oblique paſſage.

The hamſter commonly ſtores up its winter proviſions at the latter end of Auguſt. When it has filled its magazines, it covers them over, and ſhuts the avenues to them carefully with earth. This precaution renders the diſcovery of theſe animals very difficult. The heaps of earth which they throw up before the oblique paſſage, are the only marks to trace their habitations. The moſt uſual method of taking them, is by digging them out of their holes, which is attended with much trouble, on account of the depth and extent of their burrows. One however that is dextrous in this buſineſs, commonly effects his purpoſe with good ſucceſs. In autumn, he ſeldom fails of finding two good buſhels of corn in each of their habitations; and he derives great profit from the ſkins of the animals. The hamſters bring forth their young two or three times in a year, and ſeldom leſs than five or ſix each time. Some years there are great numbers of them to be ſeen, and in others, ſcarcely any to be met with. They multiply in great numbers when the ſeaſons are wet, which occaſion a great ſcarcity of grain, by the devaſtation theſe animals make.

The hamſter begins to burrow at the age of ſix weeks, or two months. It never however, copulates in the firſt year of its growth.

The pole-cat is a great enemy to the hamſters, which he deſtroys in multitudes. He not only purſues them on land, but follows them into their burrows, and feeds on them.

The back of the hamſter is commonly brown, and the belly black. There are ſome however, of a grey colour; and this difference may proceed from their age. Beſides theſe, there are ſome often met with which are entirely black.

The hamſters deſtroy each other, like field-mice; two of them being put into the ſame cage, the female ſtrangled the male in the night-time; and, having divided the muſcles that held the jaws, ſhe devoured great part of his viſcera. There are numbers produced in one year, inſomuch, that, in ſome parts of Germany, a reward is fixed on their heads. Hence their fur is ſold exceedingly cheap.

The Bobak, and other Marmots.

The name of the *Straſbourg marmot* has been affixed to the hamſter, and that of the *Poland marmot* to the bobak: however, it is certain, that the hamſter is not a marmot; and it is probable, that the bobak, is one, as it only differs from the marmot of the Alps, by the colour of its fur, which is not quite ſo grey. There is a great claw, or toe, to the fore feet of the hamſter, while the marmot has only four toes to each foot; but in other reſpects it perfectly reſembles it, which make us preſume they do not form two ſeparate ſpecies. It is the ſame with reſpect to the Canadian marmot, or monax, which ſome travellers have termed the *whiſtler*. It only ſeems to differ from the marmot in the tail, which has more hair.

The Canadian monax, the Poland bobak, and the Alpine marmots, are, probably all the ſame kind of animal, under different denominations. As this ſpecies prefers the coldeſt and higheſt mountains in Poland, Ruſſia, and other parts of the north of Europe, no wonder it is found in Canada, where it is only ſomewhat leſs than in Europe.

The Siberian animal alſo called by the Ruſſians *Jevras Chka*, is a kind of marmot, ſtill leſs than the Canadian monax.

Jerboa.

Jerboa is a generic name, which we make uſe of in this place, to denote thoſe remarkable animals whoſe legs are extremely diſproportionate; thoſe before being not above an inch long, and the others about two inches one fourth, and exactly like thoſe of a bird. There are four diſtinct ſpecies, or varieties of this kind. Firſt, the *Tarſier*, which we have already taken notice of, and which is certainly a particular ſpecies, as its toes are made like thoſe of a monkey, having five on each foot. Secondly, the *Jerboa*, whoſe feet are like the *fiſſipedes*, with four claws on thoſe before, and three on thoſe behind. Thirdly, the *Alagtaga,* whoſe feet are formed like thoſe of the jerboa, with this difference, that they have five toes on the fore, and three on the hinder feet, with a ſpur or a kind of thumb, or a fourth toe, much ſhorter than the reſt. Fourthly, the *Damon Iſrael,* or *Lamb oj Iſrael,* which has four toes to the fore feet, and five to the hinder, which may poſſibly be the ſame animal which Linnæus has deſcribed by the name of of *Mus Longipes.*

The head of the jerboa is ſloped ſomewhat in the manner of a rabbit; but the eyes are larger, and the ears ſhorter, though elevated and open, with reſpect to its ſize. Its noſe and hair are of a fleſh colour, its mouth ſhort and thick, the orifice of the mouth very narrow, the upper jaw very full, the lower narrow and ſhort, the teeth like thoſe of the rabbit. The muſtacheos are compoſed of long black and white hairs. The fore feet are very ſhort, and never touch the ground; they are furniſhed with four claws, which are only uſed as hands to carry the food to the animal's mouth. The hind feet have but three claws, the middle one longer than the other two. The tail is three times as large as its body, and is covered with ſhort, ſtubborn hair, of the ſame colour as that on the back, but tufted at the end with longer and ſofter hair. The legs, noſe and eyes are bare, and of a fleſh colour. The upper part of the head and back are covered with an aſh-coloured hair. The ſides, throat and belly are whitiſh; and below the loins, and near the tail, there is a large, black, tranſverſal band, in the form of a creſcent.

Theſe little animals commonly conceal their hands, or fore feet, within their hair; which hath induced ſome to imagine that they have only hinder feet. When they move from one place to another, they do not advance one foot before the other, but jump, or bound, about four or five feet at a time. This they do with the greateſt eaſe and ſwiftneſs, holding themſelves erect, like birds when they hop on the ground. They reſt themſelves in a kneeling poſture, and only ſleep in the day. In the night-time, they ſeek for their food, like hares, and, like them, feed on graſs, corn, and other grain. They are of a gentle nature, but not to be tamed beyond a certain limit. They burrow like rabbits, and in much leſs time. They lay up ſtore of graſs, about the latter end of ſummer, in their habitations, and, in cold countries, remain in them during the winter. They are found in Syria, Phœnicia, Barbary, &c.

Ichneumon.

This animal is domeſtic in Egypt, like our cat; and like it, is ſerviceable in deſtroying rats and mice; but, its inclination for prey, and its inſtinct is much ſtronger, and more extenſive than that of the cat; for it hunts alike, birds, quadrupeds, ſerpents, lizards, and inſects. It attacks every living creature in general and feeds entirely on animal fleſh. Its courage is equal to the ſharpneſs of its appetite: it is neither frightened at the anger of the dog, nor the malice of the cat, nor even dreads the bite of the ſerpent. It purſues them with eagerneſs, ſeizes on and kills even the moſt venomous of them. As ſoon as it begins to feel the impreſſions of their venom, it immediately ſearches for antidotes, and particularly a root that the Indians call by its name, and which, they ſay, is one of the moſt powerful remedies in nature, againſt the bite of the viper. It ſucks the eggs of the crocodile, as well as thoſe of fowls and birds. It alſo kills and feeds on very young crocodiles, and, as fable ſometimes accompanies truth, it has been currently reported, that, by virtue of this antipathy, the ichneumon enters the body of the crocodile, when it is aſleep, and never quits it till it has devoured its entrails.

Naturaliſts have ſuppoſed that there are many kinds of ichneumons, becauſe there is a difference in their ſize and in the colour of their hair. If we conſider, however, that, being frequently reared in houſes, they have, like other domeſtic animals, undergone varieties, we ſhall readily perceive, that this diverſity of colour, and this difference of ſize, only points out ſimple varieties, not ſufficient to conſtitute a ſeparate ſpecies. It alſo appears, that the ichneumons in Egypt, which may be called domeſtic, are larger than thoſe in India, which are in a wild ſtate.

The ichneumon lives very willingly by the ſides of rivers, inundations, and other waters. It quits its habitation to ſeek its prey near habitable places. It ſometimes carries its head erect, ſhortens its body before, and raiſes itſelf upon its hind legs. At other times, it creeps and lengthens itſelf like a ſerpent: it often ſits upon its hind feet, and oftener ſprings upon its prey: its eyes are lively, and full of fire: its aſpect is beautiful, the body very active, the legs ſhort, the tail thick and very long, and the hair rough and briſtly. Both male and female have a remarkable orifice, independent of the natural paſſages. It is a kind of pocket, into which an odoriferous liquor filters. The animal is ſaid to open this bag, or pocket, to refreſh itſelf when too hot. Its noſe is very ſharp, and its mouth narrow, which prevents it from ſeizing and biting any thing very large; but this defect is amply compenſated by its agility, courage, and by its power. It very eaſily ſtrangles a cat, although much bigger and ſtronger than itſelf. It often too fights with dogs of every ſize; and it for the moſt part obtains the victory.

The Foſſan.

The foſſan is called, by ſome travellers, the *Genet of Madagaſcar*: but it is, in general, far ſmaller than the genet; and beſides it has no odoriferous bag, the eſſential attribute of that animal. Its manners are much like thoſe of our pole-cat; and, when the male foſſan is particularly amorous, it emits a very ſtrong ſmell like muſk. It eats both fleſh and fruit, but prefers the laſt. It is a very wild animal, and very difficult to be tamed. The eye of the foſſan repreſents a black globe, very large in compariſon with the ſize of its head, which gives this animal a miſchievous look.

The animal called *Berba* in Guinea, ſeems to be the ſame as the foſſan, conſequently this ſpecies exiſts in Africa, as well as in Aſia.

The Vanſire.

Thoſe who have ſpoken of this animal, have taken it for the ferret, which indeed it reſembles in many reſpects, though it differs from it by characters ſtrong enough to make it a diſtinct ſpecies. The vanſire has twelve teeth, or grinders, in its upper jaw, while the ferret has only eight. The vanſire alſo differs in the colour of its hair, from all ferrets: although thoſe, like every other animal which man is eager to rear and increaſe, vary much, both male and female.

The animal called by ſome the *Weaſel of Java*, and by others the *Ferret of Java*, may poſſibly be the ſame with the vanſire.

The Maki.

This name of Maki has been given to many different kinds of animals. The firſt claſs is the mocock, or maucaucau. The ſecond is the mongooz, generally called the *brown maki;* and the third kind is the vari, which ſome call the *pied maki.*

The maucaucau is a beautiful animal, remarkable for the largeneſs of its eyes, and the length of the hinder legs, which far exceed thoſe before. It is alſo ornamented with a long tail, continually elevated and in motion, upon which are upwards of thirty rings, alternately black and white, all very diſtinct and ſeparate from one another. It is gentle; and, although it greatly reſembles the monkey in many particulars, it is not ſo malicious in its nature. It is a gregarious animal, commonly found in ſociety in its natural ſtate. In Madagaſcar, thirty or forty are ſeen herding together. It ſleeps in a ſitting poſture, with its ſnout reſting upon its breaſt: its body is no thicker than that of a cat; but it is longer; and it appears larger, as the legs of the animal are very long. The hair is very ſoft, and ſtands almoſt erect.

The mongooz is leſs than the maucaucau; but its hair is, like that, of a ſhort and ſilken nature, but a little curled. Its noſe is alſo thicker, and very like that of the vari. I had a mongooz in my poſſeſſion for ſeveral years: its coat was of a brown colour, the eyes yellow, the noſe black, and the ears ſhort. It had a cuſtom of playing with and biting its tail, and had, by this method, leſſened it by four or five of the laſt vertebræ. Whenever it got looſe, it viſited the ſhops in the neighbourhood, and would make free with fruit, ſugar, ſweetmeats, &c. to obtain which, it would open the boxes. At ſuch times, it was difficult to retake it; and it would even bite its keeper.

The vari is much larger, ſtronger and wilder than the maucaucau, and is even exceedingly ſavage and miſchievous in its free ſtate. Travellers tell us, that it is as furious as a tiger, and very difficult to be tamed; and that its voice is ſo very loud, that, when there are only two together in the woods, one would naturally imagine, that the noiſe they made, proceeded from an hundred. Its hair, in general, is much longer than that of the maucaucau; and it has a kind of ruff round the neck, conſiſting of very long hair. In other reſpects, its hair is black and white, and, although very long, ſtands almoſt erect. Its ſnout is thicker and longer than that of the maucaucau; its ears are much ſhorter, and edged with long hair; and its eyes are of ſo deep an orange colour, that, if not minutely inſpected, they appear red.

The maucaucau, the mongooz, and the vari, are all of the ſame country. They ſeem to be confined to Madagaſcar, Mozambia, and the neighbourhood of theſe iſlands.

The Lori.

The Lori is a little animal, found in Ceylon, very remarkable for the ſingularity of its conformation. It is, perhaps, of all animals, the longeſt in proportion to its ſize, having nine vertebræ in the loins; whereas other quadrupeds have only five, ſix, or ſeven. Its body appears longer as it has no tail. In other reſpects, it reſembles thoſe of the maki kind, as well in the hands and feet, as in the quality of the hair, the number of teeth, and the ſharpneſs of its ſnout. This animal ſeems to be the ſame as that which Thevenot ſpeaks of in the following terms:—“ I ſaw,” ſays he, “ a monkey at Mogul, which had been brought thither from Ceylon. It was greatly valued on account of its ſize, it being no bigger than a man's fiſt. It is a different kind from the common monkey, having a flat forehead, eyes round and large, and of a bright yellow colour, like thoſe of ſome cats. Its ſnout is very pointed: the inſide of the ears is yellow: and it had no tail. When I examined it, it ſat erect on its hind feet, folded the others acroſs its breaſt, and looked around it, at the ſpectators, without betraying the leaſt ſymptom of fear.

The Javelin Bat.

The animal in queſtion, we have denominated the *javelin bat*, from a ſort of comb, or membrane, on its noſe, which perfectly reſembles the head of a lance. Although this character alone is nearly ſufficient to diſtinguiſh it from all other animals, yet we can add that it has ſcarcely any tail, and that its hair and ſize are nearly like thoſe of the common bat, with this difference, that inſtead of having ſix inciſive teeth in the lower jaw, it has only four. This kind of bat is very common in America, and never found in Europe.

There is another bat in Senegal, which has alſo a membrane upon its noſe, in the ſhape of an oval leaf. Theſe three bats, being of different climates, are not ſimple varieties, but diſtinct and ſeparate ſpecies.

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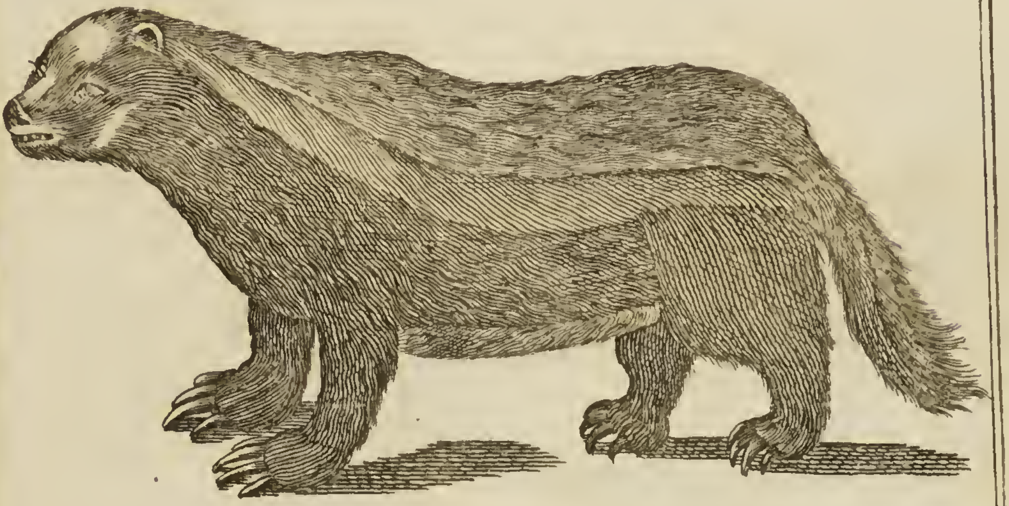

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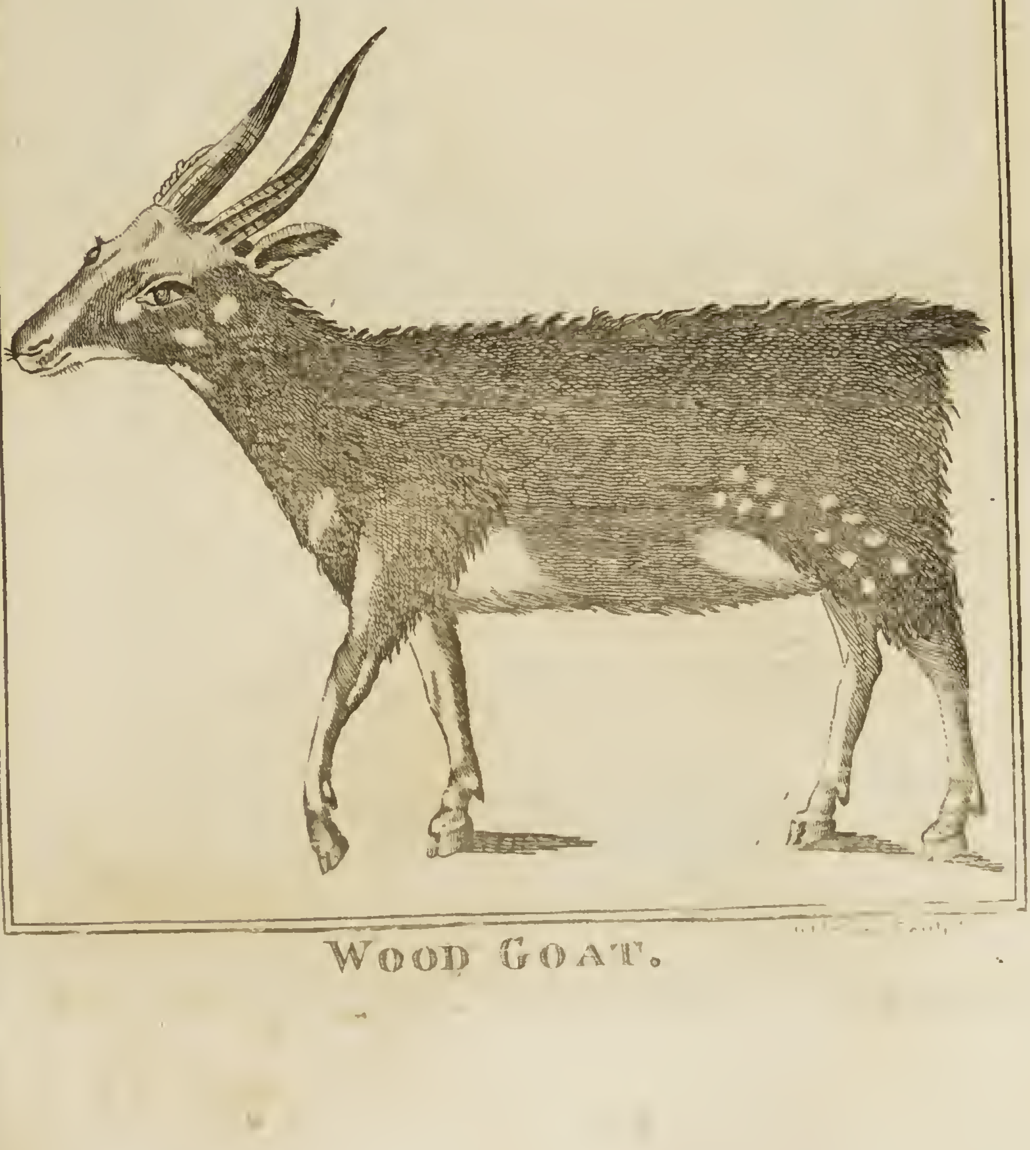

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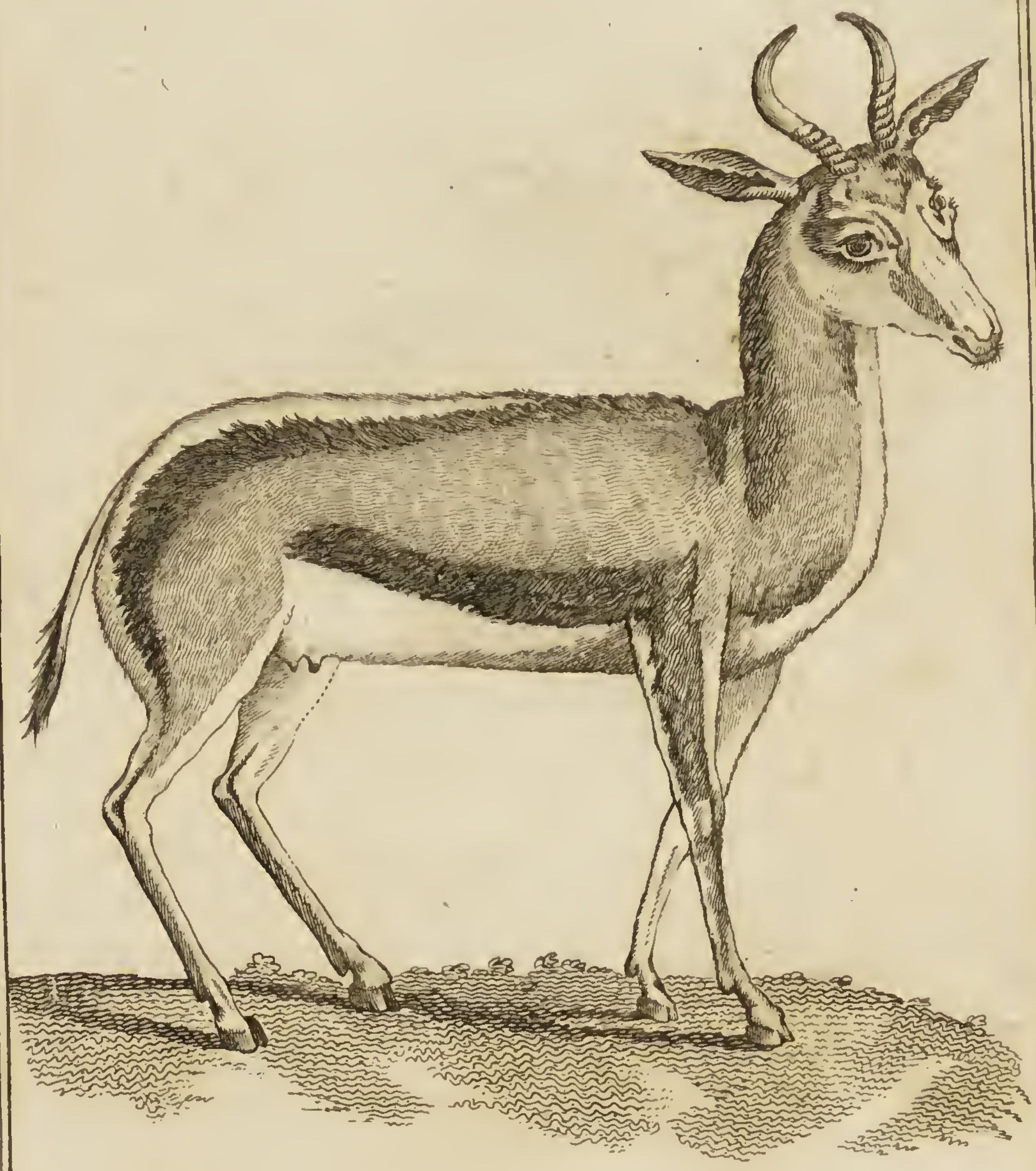

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M,DCC,XCI.

NATURAL HISTORY.

CHAP. XX.

OF THE SERVAL—THE OCELOT—THE MARGAY—THE JACKALL, AND THE ADIL—THE ISATIS—THE GLUTTON—THE STINKING POLE-CATS—THE PEKAN, AND THE VISON—THE SABLE—THE LEMING—THE CANADIAN OTTER—THE SEAL—THE SEA LION—THE MORSE—THE DUGON—THE MANATI.

The Serval.

THIS animal has been kept alive ſeveral years in the royal menagerie, by the name of the *tiger cat;* and we ſhould have ſtill remained ignorant of its true name, if M. de Montmirail had not found it out in the account of an Italian voyage, which he has tranſlated:—"The *maraputia*, which the Portugueſe in India call *ſerval*," ſays Vincent Maria, "is a wild and ferocious animal, much larger than the wild cat, and ſomewhat leſs than the civet, which it differs from by its head being rounder and thicker in proportion to its body, and its face ſinking in about the middle of it. It reſembles the panther in the colour of the hair, which is brown upon the head, back and ſides, and white under the belly; and alſo in the ſpots, which are diſtinct, equally diſtributed, and leſs than thoſe of the panther. Its eyes are very brilliant: its whiſkers are compoſed of long and ſtiff briſtles; its tail is ſhort; its feet large, and armed with long and hooked claws. It inhabits the mountains of India, and is very ſeldom ſeen on the ground. It remains almoſt continually upon high trees, where it catches birds, on which it feeds. It leaps alſo as nimbly as a monkey, and conveys itſelf from one tree to another with ſuch great addreſs and agility, that it may be ſaid only to appear and diſappear. It is ferocious in its nature, but flies the approach of man."

Neither good nor bad treatment, will ſoften the ferocity of this animal. It ſeems to be the ſame creature as the tiger-cat of Senegal and the Cape of Good Hope, which, according to the teſtimony of travellers, reſembles our cat in its ſhape and ſize. "This animal," they ſay, "is four times as large as a cat, of a voracious nature and feeds like the monkey, the rat, &c."

The Ocelot.

The Ocelot is a furious and carnivorous animal, which muſt be placed next the jaguar, or the cougar; for it is very near the ſize, and reſembles them in its nature and figure. A male and a female ocelot were ſhewn at the fair of S. Ovid, in September of 1764. They came from the countries adjoining to Carthagena, and had been taken from their dam in the month of October, 1763; they became ſo ſtrong and cruel at the end of three months, as to devour the bitch which had nurſed them. When we ſaw them, they were about a year old, and about two feet long. They had then, probably, only attained one half or two thirds of their growth. Theſe animals were ſhewn by the name of the *tiger cat;* but we have rejected this denomination as precarious and confuſed, eſpecially as the jaguar, ſerval, and the margay, have been ſent to us with the ſame name. Thoſe three animals are very different indeed from each other, and from the animal which is the ſubject of our preſent deſcription.

A full grown ocelot is two feet and a half high, and about four feet long. Its tail, although of a ſufficient length, does not touch the ground when it is hanging down, and conſequently it is not two feet long. This animal is very voracious, but at the ſame time timid. It very ſeldom attacks the human ſpecies, and is terrified at the ſight of a dog. When it is purſued, it flies to the foreſts, and climbs up a tree to ſave itſelf, where it ſleeps, and watches for its prey. It prefers blood to fleſh; hence it deſtroys ſuch a number of animals; for, inſtead of ſatisfying its hunger by eating them, it only quenches its thirſt by ſucking their blood.

In its captive ſtate, it preſerves its ferocious nature; nothing can tame it, nor quiet its reſtleſs motion, which obliges its keeper to confine it conſtantly in a cage.

The Margay.

The Margay is much ſmaller than the ocelot. It reſembles the wild cat in the ſize and ſhape of its body. Its head however is more ſquare, its ſnout longer, its ears rounder, and its tail longer: its hair alſo is ſhorter, and it has black ſtreaks and ſpots on a brown ground. It was ſent to us from Cayen, by the name of the *tiger-cat;* and, in fact, it partakes of the nature of the cat and the jaguar, or the ocelot, which are the two animals to which the name of tiger has been affixed in the New Continent. According to Fernandes, when this animal is full grown, it is not quite ſo large as the civet. According to Marcgrave, whoſe compariſon is juſter, it is about the ſize of a wild cat, which it alſo reſembles in its natural habits, living only upon fowls, and other ſmall game. It is ſuch as we have here deſcribed it. This animal is very common in Braſil, and in all the other provinces of South America.

The Jackal, and the Adil.

We are not certain, that thoſe two names denote two animals of different ſpecies. We only know that the jackal is a larger animal, which is more ferocious, and difficult to be tamed than the adil. From the narratives of travellers, it appears, that there are both great and ſmall jackals, as well in America, as in Sileſia, Ruſſia, and every part of Aſia, which we call the Levant, where this ſpecies is very numerous, very troubleſome, and very hurtful. Theſe animals are generally about the ſize of our foxes; but their legs are ſhorter; and they are remarkable for the colour of their hair, which is of a gloſſy and bright yellow. Hence ſeveral authors have called the jackal the *golden wolf.* As both the jackal and the adil, however, are natives of the ſame countries; as the ſpecies has not been altered by a long domeſticity, and as there is a conſiderable difference in the ſize, and even in the nature of theſe animals, we ſhall conſider them as two diſtinct ſpecies, with the reſerve of uniting them, when we ſhall have occaſion to prove, that they cohabit and copulate together.

As the ſpecies of the wolf approaches that of the dog, ſo the jackal finds a place between the two. The *jackal* or *adil*, as Belon ſays, *is a beaſt between the wolf and the dog.* In it the ferocity of the wolf is a little tempered with the familiarity of the dog Its voice is a kind of howl, mixed with barking and groaning: it is more noiſy than the dog, and more voracious than the wolf: it never ſtirs out alone, but always in packs, of twenty, thirty, or forty. They collect together every day, to go in queſt of prey: they make themſelves formidable to the moſt powerful animals, by their number: they attack every kind of beaſts or birds, almoſt in the preſence of the human ſpecies: they abruptly enter ſtables, ſheepfolds, and other places, without any ſymptom of fear; and when they cannot meet with any other thing, they will devour boots, ſhoes, harneſſes, &c. and what leather they have not time to conſume, they carry off with them. When they cannot meet with any live prey, they dig up the dead carcaſes of men and animals. The natives are obliged to cover the graves of the dead with large thorns, and other things, to prevent them from ſcratching and digging up the dead bodies. The dead are buried very deep in the earth; for it is not a little trouble that diſcourages them Numbers of them work together, and accompany their labour with a doleful cry. As ſoon as they are accuſtomed to feed on dead bodies, they run from country to country, follow armies, and keep cloſe to the caravans. This animal may be ſtiled the crow of quadrupeds; for they will eat the moſt putrid or infectious fleſh. Their appetite is ſo conſtant, and ſo vehement, that the drieſt leather is ſavory to them; and ſkin, fleſh, fat, excrement, or the moſt putrified animal, is alike to their taſte.

The Iſatis.

The iſatis is very common to be met with in the northern countries, and but rarely found on this ſide ſixty-nine degrees latitude. It is nearly two feet in length: it perfectly reſembles the fox, in the form of its body, and the length of the tail; but its head is like that of a dog. Its hair is ſofter than that of the common fox: its head is ſhort in proportion to its body: it is broad towards the neck, and terminates in a ſharp-pointed ſnout. Its ears are almoſt round. There are five claws to the fore feet, and only four toes and four claws to the hinder ones. The hair on every part of the body is about the length of two inches, ſmooth and ſoft as wool.

The voice of the iſatis participates of the barking of the dog, and the yelping of the fox. Thoſe who deal in furs, diſtinguiſh two animals of this kind, the one white, and the other aſh coloured. The laſt are the moſt valuable.

The iſatis lives upon rats, hares, and birds, which it catches with as much ſubtilty as the fox. It plunges in the water, and traverſes the lakes, in queſt of water-fowls and their eggs. The only enemy it has in the deſart and cold countries which it inhabits, is the *glutton.*

The Glutton.

The body of the glutton is thick, and its legs are ſhort. It is nearly of the ſize of a ram, but twice as thick. Its head is ſhort, its eyes ſmall, its teeth very ſtrong, its tail rather ſhort, and covered with hairs to its extremity. It is black along the back, and of a reddiſh brown on the flanks. Its fur is exceedingly beautiful, and much valued. It is common in Lapland, and all the neighbouring countries of the Northern Sea, as well in Europe as in Aſia. It is called *Carcajou* in Canada, and the northernmoſt parts of America. The animal pointed out by Fernandes, by the name of the *Mountain Dog*, is probably of the glutton ſpecies, which poſſibly is diſperſed as far as the deſart mountains of New Spain.

The legs of the glutton are not formed for running. Its pace is very ſlow; but its cunning ſupplies this deficiency: it waits the arrival of its prey in ambuſh; and in order to ſeize it with greater ſecurity, it climbs up a tree, from which it darts down on the elk and the rein deer, and faſtens itſelf ſo ſtrongly with its claws and teeth, that the utmoſt efforts of the animal cannot remove it. The animal in vain flies with its utmoſt ſpeed: in vain it rubs itſelf againſt trees, and other objects. Faſtened on its back or loins, the glutton ſtill perſiſts in tormenting it, by digging into its fleſh, and ſucking its blood, till it expires. Upon this the glutton devours it by piecemeal, with the utmoſt avidity and obſtinate cruelty. It is incredible how long the glutton will eat at a time, and what a quantity of fleſh it will devour at one ſingle meal.

From this quality, the glutton has obtained the name of the *Quadruped Vulture*. It is more inſatiable, and commits greater depredations, than the wolf. It would deſtroy every animal, if it had ſufficient agility; but the only animal it is capable of taking on foot, is the beaver, which it eaſily overcomes. It even often attacks that animal in its hole, and devours both it and its young, if they do not get to the water in time; for then the beaver eſcapes its enemy by ſwimming, and the glutton ſtops its purſuit to feed upon the fiſh. When it can procure no living food, it goes in ſearch of carcaſes, ſcratches open graves, and devours the fleſh of dead bodies to the very bone.

Although this animal is ſubtle, and uſes every art to conquer other animals, it appears deſtitute of inſtinct for its own preſervation. It ſuffers the human ſpecies to approach it without the leaſt appearance of fear. This indifference, which ſome may take for imbecility, is occaſioned, perhaps, by a very different cauſe. It is certain, that the glutton is not a ſtupid animal, ſince it readily finds means to ſatisfy its perpetual and almoſt immediate appetite. It does not want courage, ſince it attacks every animal that comes in its way, and does not fly at the ſight of man, nor even ſhew the leaſt mark of ſpontaneous fear. If, therefore, it is deficient in a proper care for its own ſafety, it does not ariſe from an indifference for its own preſervation, but only from its habit of ſecurity, as it is a native of almoſt every deſart country, where it ſeldom meets with any of the human ſpecies.

As the iſatis is not ſo ſtrong, but much ſwifter than the glutton, it ſerves the latter as a purveyor: for, the moment the glutton approaches the iſatis, to avoid deſtruction itſelf, it leaves what remains, for the glutton. Both theſe animals burrow in the ground; but in every other habit they are different. The iſatis may be termed a ſocial, whilſt the glutton may be accounted a ſolitary animal. The fierceſt dogs are fearful of attacking the glutton, which defends itſelf with its teeth and feet, and often mortally wounds them.

The fleſh of the glutton, like that of every other voracious animal, is very unpalatable. It is only hunted for its ſkin, which makes an exceedingly good and beautiful fur, not inferior to that of the ſable and black fox. It is alſo ſaid, that, when properly choſen and well dreſſed, it has a more excellent gloſs than any other ſkin, and has even the beauty of a rich damaſk.

The Stinking Polecats.

The ſtinking polecats are found in every part of South America. They may be divided into four ſpecies; the *ſquaſh*, the *conepate*, the *ſkink*, and the *zorille*. The two laſt may be conſidered as originals, as we do not meet with their figure in any other author.

The firſt of theſe animals is about ſixteen inches long: its legs are ſhort, its ſnout pointed, its ears ſmall, its hair of a deep brown, and its claws black and ſharp. It chiefly inhabits the hollows and clefts of rocks, where it brings forth its young. It preys upon ſmall animals, birds, &c. and when it can ſteal into a farm yard, it kills the poultry, but only eats their brains. When it is purſued or offended, it ſummons up all its diabolical ſcents to its defence, and emits ſuch a horrid ſtench, that it is dangerous for men or dogs to approach it. Its urine is apparently infected with this nauſeous vapour, which, however, we muſt obſerve, does not ſeem habitual to it.

Among the four kinds of *ſtinkards* we have mentioned above by the names of the *ſquaſh*, *conepate*, *ſkink*, and *zorille*, the two laſt belong to the hotteſt countries of South America, and may poſſibly be no more than two varieties, and not two different ſpecies. The two firſt are varieties of New Spain, Louiſiana, Carolina, and other temperate climates, and appear to me to be two ſpecies diſtinct and different from the reſt; but principally the ſquaſh, which has a particular character, of having only four claws on the fore feet, whereas all the reſt have five. Notwithſtanding this, theſe animals have nearly the ſame figure, the ſame inſtinct, the ſame offenſive ſcent, and only differ, as I may ſay, by the colour and length of the hair. The ſquaſh, as has been obſerved, is of a pretty uniform brown colour, and its tail is not tufted like the reſt. The conepate has five white ſtripes on a black ground, running longitudinally from the head to the tail. The ſkink is white on the back, and black on the ſides, but quite black on the head, except a white ſtreak, which runs from the nape of the neck to the fore-head. Its tail is tufted, and clothed with very long white hairs, mixed with ſome of a black colour.

The zorille, which is alſo called mauripita, is ſtill ſmaller, and has a moſt beautiful tail, furniſhed with as great abundance of hair as the ſkink, from which it differs by the diſpoſition of the ſpots on its coat, the white ſtreaks running longitudinally from the head to the middle of the back, on a black ground. Beſides theſe, there are other kinds of ſtreaks, which paſs tranſverſely over the loins, the crupper, and the root of the tail, one half of which is black and the other white, whereas in the ſkink they are all of the ſame colour.

Kalm, ſpeaking of this animal ſays, " one of them came near the farm where I lived. It was in winter, and during the night, and the dogs that were upon the watch, purſued it for ſome time, until it diſcharged its urine againſt them. Although I was in my bed a good way off, I thought I ſhould have been ſuffocated, and the cows and oxen, by their lowings, ſhewed how much they were affected by the ſtench. About the end of the ſame year, another of thoſe animals crept into our cellar, but did not exhale the ſmalleſt ſcent, becauſe it was not diſturbed. A fooliſh woman, however, who perceived it at night, by the ſhining of its eyes, killed it, and at that moment its ſtench began to ſpread. The whole cellar was filled with it to ſuch a degree, that the woman kept her bed for ſeveral days after, and all the meat, bread, and other proviſions, that were kept there, were ſo infected, that they were obliged to be thrown out of doors."

All theſe animals are nearly of the ſame form and ſize as the European pole-cat. They reſemble it alſo by its natural habits; and the phyſical reſult of their generation are the ſame.

The Pekan and the Viſon.

The name of pekan has long been familiar to the fur merchants of Canada, without their knowing the animal to which it has been appropriated. We are alſo ignorant of the origin of the name of the *viſon* as well as of the *pekan*, and it is only ſaid that they belong to two different animals of South America.

The pekan ſo ſtrongly reſembles the marten, and the viſon is ſo very like the pole-cat, that we are inclined to look on them as varieties of theſe two ſpecies. Hence we regard the pekan as a variety in the ſpecies of the marten, and the viſon as a variety in that of the pole-cat, or, at leaſt to conſider them as ſpecies approaching ſo near each other, that they do not exhibit any real difference. The hair of the pekan and the viſon is only more ſoft, brown and gloſſy than that of the marten and pole-cat, but this difference, is common to them as well as to the beaver, otter, and other animals of North America, whoſe fur is more beautiful than that of thoſe in the north of Europe.

The Sable.

Almoſt every naturaliſt has ſpoken of this animal without knowing any thing more of it than its ſkin. Mr Gmelin is the firſt who has given its figure and deſcription: he ſaw two living ones at the governor of Toboliſki's. "The ſable, (ſays he) reſembles the marten in its ſhape and habit of body, and the weaſel in the number of its teeth. It has large whiſkers about the mouth, its feet are broad, and armed with five claws, like the reſt of its kind. Theſe characters were common to theſe two ſables; but one of them was of a dark brown, except the ears and the throat, where the hair was rather yellow; the other, which was ſmaller, was more of a yellowiſh caſt: its ears and throat being alſo much paler. Theſe are the colours they both have in winter, and which they are ſeen to change in the ſpring; the former becoming of a yellow brown, the other of a pale yellow."

Theſe animals inhabit the banks of rivers in ſhady places, and in the thickeſt woods. They leap with great eaſe from tree to tree, and are ſaid to be afraid of the ſun, which tarniſhes the luſtre of their robes in a very ſhort time. They are alſo improperly ſaid by ſome, to hide themſelves, and to remain torpid during the winter. This ſeaſon, on the contrary, is the principal time in which they are hunted as their ſkins are far better in winter than in ſummer. They live on rats, fiſh and wild fruit. They have the diſagreeable odour of their kind. They are moſtly found in Siberia, and but very few in Ruſſia, and there are ſtill fewer in Lapland and other countries. The blackeſt ſkins are the moſt eſteemed. The difference of this ſkin from others, conſiſts in the quality of the fur, which has no grain, and when rubbed any way, is equally ſmooth and unreſiſting; whereas, the furs of other animals, rubbed againſt the grain, give a ſenſation of roughneſs from their reſiſtance.

The hunting of the ſable is impoſed on condemned criminals, who are ſent from Ruſſia into theſe wild foreſts, which, for a great part of the year, are covered with ſnow. Theſe unfortunate wretches remain there many years, and are obliged to furniſh a certain number of ſkins every year. They only kill this animal by a ſingle ball, in order to damage it as little as poſſible; and ſometimes, inſtead of fire arms, they make uſe of the croſs-bow and very ſmall pointed arrows. As the ſucceſs of this hunting, ſuppoſes addreſs and great aſſiduity, the officers are permitted to encourage, by allowing the huntſmen, to ſhare among themſelves the ſurplus of thoſe ſkins which they procure; and this, in a few years, amounts to a very conſiderable ſum.

The Leming, or Lapland Marmot.

The Leming, or Lapland Marmot, is of the ſhape of a mouſe, but has a ſhorter tail. Its body is five inches long, covered with fine hair of various colours. The extremity of the upper part of the head and likewiſe the neck and ſhoulders are black; but the reſt of the body is reddiſh, intermixed with ſmall black ſpots of various figures. The tail, which is not above half an inch long, is covered with browniſh hairs, and the ſpots vary, both in their form and ſize. In ſome there are many red hairs about the mouth, reſembling whiſkers, ſix of which are longer and redder than the reſt. The mouth is but ſmall, and the upper lip is divided like that of the ſquirrel. The remains of the food in the throat of this animal, incline us to imagine it ruminates. The eyes are ſmall and black; the ears round, and inclining towards the neck. The legs before are ſhort, and thoſe behind longer, which gives it a greater degree of ſwiftneſs: the feet are clothed with hair, and armed with five very ſharp crooked claws: the middle claw is very long, and the fifth is like a little finger, or the ſpur of a cock, ſometimes placed very high up the leg. The colour of the hair on the belly, is between white and yellow. This animal, therefore, whoſe legs are very ſhort, runs very ſwift. It generally inhabits the mountains of Norway and Lapland, but they deſcend in ſuch great numbers in ſome years, and in ſome ſeaſons, that the inhabitants look on their arrival as a terrible and inevitable ſcourge. They move, for the moſt part, in a ſquare, marching forward by night, and reſting by day. Thus, like an animated torrent, they are often ſeen more than a mile broad, covering the ground, ſo thick, that the hindmoſt touches its leader. It is in vain, that the inhabitants reſiſt, or attempt to ſtop their progreſs: they ſtill keep moving forward; and though thouſands are deſtroyed, myriads are ſeen to ſuceed and make their deſtruction impracticable. They generally move in lines, which are about three feet from each other, and exactly parallel. Their march is always directed from the north-weſt to the ſouth-weſt, and regularly conducted from the beginning. Whenever their motions are turned, nothing can ſtop them: they go directly forward, impelled by ſome ſtrange power; and from the time they at firſt ſet out, they reſolutely perſiſt. If a lake, or a river, happen to preſent itſelf as an obſtacle, they take the water in a body. A fire, a deep well, or a torrent, does not turn them out of their ſtrait lined direction; they boldly plunge into the flames, or leap down the well, and are ſometimes ſeen climbing up on the other ſide. If they are interrupted by a boat acroſs the river while they are ſwimming, they never attempt to ſwim round it, but mount directly up its ſides; and the boatmen, who know how vain reſiſtance would be, calmly ſuffer the living torrent to paſs over. If they meet with a ſtack of hay or corn which interrupts their paſſage, they gnaw their way through it; if they are ſtopped by a houſe in their courſe, if they cannot get through it, they continue there till they die. It is lucky, however, that they eat nothing that is prepared for human ſubſiſtance. They never enter an houſe to deſtroy the proviſions, but are contented to eat every root and vegetable that they find. If they happen to paſs through a meadow, they deſtroy it in a ſhort time, and give it an appearance of being burnt up and ſtrewed with aſhes. If they are interrupted in their courſe, and a man ſhould imprudently venture to attack one of them, the little animal is not the leaſt intimidated by the diſparity of ſtrength, but furiouſly flies up at its opponent, and barking ſomewhat like a puppy, wherever it faſtens it does not eaſily quit its hold. If, at laſt, the leader be found out of its line, which it defends as long as it can, and be ſeparated from the reſt of its kind, it emits a plaintive cry, different from that of anger, and, according to ſome, hangs itſelf on the fork of a tree.

An enemy ſo numerous and deſtructive, would quickly render the countries, where they appear, utterly uninhabitable, did it not fortunately happen, that the ſame rapacity that animates them to deſtroy the labours of mankind, alſo impels them to deſtroy each other. After committing incredible devaſtations, they are ſeen to ſeparate into two armies, oppoſed with deadly hatred along the coaſt of the larger lakes and rivers. The Laplanders, who obſerve them thus drawn up to fight inſtead of conſidering their mutual animoſities as a fortunate deliverance of the moſt dreadful peſt, form ominous prognoſtics from the manner of their engagments. They conſider their combats as a preſage of war, and expect an invaſion from the Ruſſians or Swedes, as the ſide, next thoſe kingdoms happen to conquer. The two diviſions, however, continue their engagements and animoſity until one part overcomes the other; after which they diſappear entirely, nor is it well known what becomes of either the conquerors, or the conquered. Some ſuppoſe, that they ruſh headlong into the ſea. Others, imagine that they kill themſelves, as ſome are found hanging on the forked branches of a tree; and others, that they are deſtroyed by the young ſpring herbage. But the moſt probable conjecture is, that having devoured the vegetable productions of the country, and having nothing more to ſubſiſt on, they devour each other. Be this as it may, they are often found dead by thouſands, and their carcaſes have been known to infect the air for ſeveral miles round, and to produce very malignant diſorders. They ſeem alſo to infect the plants they have gnawed, for the cattle which feed in the places they have paſſed, frequently die ſoon after. The inhabitants have an opinion, as they do not know whence ſuch numbers proceed, that they fall with the rain.

The male is generally larger and more beautifully ſpotted than the female. They go in droves into the water; but no ſooner does a ſtorm of wind ariſe, than they are all drowned. The fleſh of the lemings is horrid food, and their ſkin, although covered with a beautiful fur, is of too little conſiſtence to be uſeful.

The Canadian Otter.

This otter, which is much larger than the common otter, muſt be a native of the north of Europe, as well as of Canada. It appears to be larger and blacker than the common otter; but it is rather a variety than a diſtinct ſpecies.

The Seal.

This animal has its head round, like that of the human ſpecies: its ſnout is broad, like the otter's; its eyes large and elevated. It has hardly any external ſigns of ears: it has only two auditory paſſages in the ſides of the head: it has whiſkers about its mouth, and its teeth ſomewhat reſemble thoſe of the wolf: the tongue is forked at the point: the body, hands, and feet, are covered with a ſhort and briſtly hair. It has no legs, but two feet, or membranes, like hands, with five toes, terminated by an equal number of claws. Theſe membranes, which have the appearance of hands, are only larger and turned backwards, as if deſigned to unite with its very ſhort tail, which they accompany on both ſides. The body is thickeſt where the neck is joined to it, whence the animal tapers down to the tail like a fiſh. This amphibious animal, though of a very different nature from that of our domeſtic animals, yet ſeems to be ſuſceptible of a kind of education. It is fed by putting it often in water: it is taught to ſalute perſons with its head and its voice: it is accuſtomed to obey the call of its keeper, and gives many other ſigns of intelligence and docility.

The ſenſations of the ſeal are as perfect, and its ſagacity as quick, as thoſe of any other quadruped. Both the one and the other are ſtrongly marked by its docility, its ſocial qualities, its ſtrong inſtinct for its female, its great attention towards its young, and by its voice, which is more expreſſive, and more modulated, than in any other animal: its body is likewiſe firm and large. It is alſo ſtrong, and armed with very ſharp teeth and claws, and has many particular and ſingular advantages over any other animal we can compare with it. It endures both heat and cold, and feeds indifferently on graſs, fleſh or fiſh: it can live on ice, land, or in the water. This animal and the morſe are the only quadrupeds which deſerve the name of *Amphibious*, or which have the *foramen ovale* open, conſequently, they are the only animals which can exiſt without reſpiration, and to which the element of water is as agreeable as that of the air.

But theſe advantages, which are very great, are counterbalanced by imperfections ſtill greater. They may be ſaid to be deſtitute of the uſe of their fore-legs, or membranes; for they are almoſt entirely ſhut up within its body, while nothing appears but the extremities of them, which are furniſhed with five toes, ſcarcely moveable, being united together by a very ſtrong membrane. They might therefore more properly be called fins than feet, as they are more adapted for the purpoſe of ſwimming than walking, the hind-feet, indeed, being turned backwards, are entirely uſeleſs upon land. Hence when the animal is obliged to move, it drags itſelf forward like a reptile, and with an effort more painful; for it cannot twiſt itſelf about like the ſerpent, but lies like a lump on the earth, and by graſping whatever it finds in its reach, drags itſelf up the ſteepeſt ſhores, rocks, and ſhoals of ice. By this method it moves with ſuch a degree of ſwiftneſs, that a man cannot overtake it: it makes its way towards the ſea, and often, though wounded, baffles the huntſman.

The ſeal is a ſocial animal, and generally found in great numbers in the places they frequent. Their natural climate is the northern, but they are alſo met with in temperate and even in hot countries; for they are ſeen on the ſhores of almoſt all the ſeas in the univerſe. The ſpecies alone ſeems to vary, and, according to the difference of climates, changes its colour and even its ſhape. We have ſeen ſome of theſe animals alive, and many of their ſkins have been ſent to us; out of which we have choſen two for our preſent ſubject: the firſt is, the ſeal of our European Sea, of which there are many varieties. The proportions of the body ſeem different from thoſe of any other, its tail being ſhorter, its body longer, and its claws larger; but theſe differences are not conſiderable enough to make it a ſeparate and diſtinct ſpecies. The ſecond, the ſeal of the Mediterranean and ſouthern ſeas, and which we preſume to be the *phoca* of the ancients, appears to be of another ſpecies, for it differs from every other, both in the quality and colour of the hair, which is almoſt black, whereas in the other kind it is grey and briſtly. Its teeth and ears are alſo different; and its arms, or fins, are ſituated more backward. Nevertheleſs, theſe diſagreements, perhaps, are only varieties owing to the climate, and not ſpecifical differences, though there are numbers of theſe animals to be met with in thoſe parts, larger, ſmaller, thicker, or thinner, and of hair coloured, according to their ſex and age.

The females of theſe animals bring forth in winter, and rear their young upon ſome ſand-bank, rock, or ſmall iſland, at ſome diſtance from the continent. When they ſuckle their young, they ſit upon their hinder legs, and they continue with their dam for twelve or fifteen days, after which ſhe brings them down to the water, teaches them to ſwim, and to procure their food by their own induſtry. As each litter, never exceeds three or four, ſo the animal's cares are not much divided, and the education of her young is ſoon completed. The young particularly diſtinguiſh the voice of their dam among the numerous bleatings of the old ones, and are perfectly obedient to her call. We are unacquainted with the time of the female's geſtation; but, if we judge from the time of their growth, the length of their lives, and the ſize of the animals, it will appear to be many months. The time alſo that intervenes, from their birth till they are full grown, being many years, they of courſe muſt live very long. I am of opinion, that theſe animals live upwards of an hundred years; for we know, that cetaceous animals in general live much longer than quadrupeds; and as the ſeal fills up the chaſm between the one and the other, it muſt participate of the nature of the former, and, conſequently live much longer than the latter.

The voice of the ſeal may be compared to the barking of an angry dog. When young, it has a ſhrill note, ſomewhat like the mewing of a cat. Thoſe that are taken early from their dams, mew continually, and will very often die ſooner than take the food that is offered them. Theſe animals in general, are of a courageous nature. It is remarked, that inſtead of being terrified at thunder and lightning, they are rather delighted, generally come on ſhore in tempeſts and ſtorms, and even quit their icy abodes to avoid the ſhock of the tempeſtuous waves. At ſuch times, they ſport in great numbers along the ſhore: the tremendous conflict ſeems to divert them, and the heavy rains that fall appear to enliven them. They have naturally a diſagreeable ſcent, and when there are great numbers together, it is ſmelt at a great diſtance. It often happens, that when purſued, they drop their excrements, which are of a yellow colour, and which emit a moſt diſagreeable effluvia. As they have a prodigious quantity of blood, and are alſo greatly overloaded with fat, they are, conſequently of a very dull and heavy nature. They uſually ſleep ſoundly, and are fond of taking their repoſe on flakes of ice, or ſides of rocks, at which time, the huntſmen approach very near without diſturbing them. They are very ſeldom killed with fire-arms; for, as they do not immediately die, even if they are ſhot in the head, they plunge into the ſea. The general method therefore is, to ſurpriſe them when aſleep, and knock them on the head. "They are not eaſily killed, (ſays a modern traveller) for although they are mortally wounded, and their blood nearly exhauſted, and even ſtripped of their ſkins, yet they ſtill continue alive. Indeed, it is a diſagreeable ſight to ſee theſe animals wounded and ſkinned, wallowing and rolling about in their blood in the greateſt agonies. Theſe remarks were made on the animals we killed, which were about eight feet long, for, after they were ſkinned, and even deprived of a great part of their fat, they ſtill attempted to bite their butchers. One of them even ſeized a lance which was preſented to it, with as much eagerneſs as if it had not been wounded. Upon this we pierced it through the heart and liver, whence as much blood guſhed out as is contained in a young fox."

The Sea Lion.

To the ſpecies of ſeals as above deſcribed we may, with great propriety add another animal, deſcribed in Anſon's voyages, by the name of the *ſea lion.* They abound on the coaſts of the ſouth ſea. The ſea lion reſembles our ſea calf, which is very common in the ſame latitude, but they are much larger than any of the former, being from eleven to eighteen feet long, and from eight to eleven in circumference. It is ſo fat, that when the ſkin is taken off, the blubber is about a foot thick all round the body. About ninety gallons of oil is extracted from one of theſe animals: they are at the ſame time very full of blood, and when deeply wounded in many parts of the body, the blood ſpouts out with amazing power. The throat of one of theſe animals being cut, it afforded two barrels of blood, and there was ſtill ſome in its body. Its ſkin is covered with a ſhort hair of a browniſh colour, but blackiſh on the tail and feet. Their toes are united by a membrane which does not reach to their extremity; and each of the toes is known by a claw. The ſea lion differs from the ſeal, not only in its ſize and bulk, but alſo in ſome other reſpects. The male has a kind of thick comb or trunk hanging from the end of their upper jaw, about five or ſix inches long. This character is not ſeen in the female. The ſtrongeſt males collect a flock of females, and hinder the reſt from approaching them. Theſe animals are truly amphibious: they remain all the ſummer in the ſea, and go on ſhore in winter, at which ſeaſon the females bring forth their young, but never above one or two at a litter, which they ſuckle, like the ſeal.

The ſea lions, while they are on ſhore, feed on the graſs by the ſides of the ſea. They are of a very heavy and drowſy nature, and delight to ſleep in the mire; but they are very wary, and commonly fix ſome as centinels near the place where they ſleep. It is ſaid too, that theſe centinels are very careful to awake them in caſe of imminent danger. Their voices are very ſhrill, and of various tones. Sometimes they grunt like hogs, and ſometimes they neigh like horſes. The males often

ten fight, and wound one another deſperately with their teeth. The fleſh of theſe animals is not diſagreeable to eat; particularly the tongue, which is as good as that of the ox. They are very eaſily killed, as they cannot defend themſelves, nor fly from their enemies. They are ſo heavy, that they move, and turn themſelves about very unwieldily. Thoſe who hunt them have only to guard againſt their teeth, which are very ſtrong.

By comparing other obſervations and accounts, the ſea lion of South America, appears to be nearly the ſame, with that found on the northern coaſts of the ſame continent. The great ſeal of the Canadian ſea, which Davis calls the ſea wolf, and which he diſtinguiſhes from the common ſea calf, might probably be nothing elſe but the lion. Their young, ſays this author, are larger and longer than our largeſt hog.

The Morſe, or Sea Cow.

The name of ſea-cow, by which the morſe is moſt generally known, has been very wrongly applied; becauſe the animal which it denotes has not the leaſt reſemblance to the land-cow. The denomination of ſea-elephant, which others have given it, is much better imagined, as it is founded on a ſingular and very apparent character. The morſe, like the elephant, has two large ivory tuſks, which project from the upper jaw. Its head alſo is formed, or rather deformed, like that of the elephant, and would entirely reſemble it in that part if it had a trunk; but the morſe is deprived of that inſtrument which ſerves the elephant inſtead of an arm and hand, and has real arms to make uſe of. Theſe members, like thoſe of the ſeal, are ſhut up within the ſkin, and nothing appears outwardly but its hands and feet. Its body is long and tapering, thickeſt towards the neck. The whole body is cloathed with a ſhort hair: the toes, and the hands, or feet, are covered with a membrane, and terminated by ſhort and ſharp-pointed claws. On either ſide of the mouth are large briſtles in the form of whiſkers. Its tongue is hollowed, the concha of the ears are wanting, ſo that, except the two great tuſks, and the cutting teeth, which it wants above and below, the morſe in every other particular perfectly reſembles the ſeal. It is only much larger and ſtronger, the morſe being commonly from twelve to ſixteen feet in length, and eight or nine in circumference. The largeſt ſeals are on the other hand, ſeven or eight feet. The morſes alſo are generally ſeen to frequent the ſame places as the ſeals are known to reſide in, and are almoſt always found together. They have the ſame habitudes in every reſpect, only that there are fewer varieties of the morſe than the ſeal. They likewiſe are more attached to one particular climate, and are rarely found except in the northern ſeas.

“ According to Zordrager, morſes and ſeals abounded formerly in the bays of Horiſont and Klock, but at preſent there are very few. Both theſe animals quit the water in the ſummer, and reſort to the neighbouring plains, where there are flocks of them from eighty or two hundred, particularly morſes, which remain there, till hunger obliges them to return to the ſea. This animal externally reſembles the ſeal, but it is ſtronger and much larger. Like the ſeal, it has five toes to each paw, but its claws are ſhorter, and its head thicker and rounder: its ſkin is thick, wrinkled, and covered with very ſhort hair of different colours: its upper jaw is armed with two teeth about half an ell or an ell long. Theſe tuſks, which are hollow at the root, become larger as the animal grows older. Some of them are found to have but one, the other being torn out in their mutual hoſtilities, or perhaps fallen out through age. This ivory generally brings a greater price than that of the elephant, as it is of a more compact and harder ſubſtance. The mouth of this animal is like that of the ox, and furniſhed with hairs which are hollow, pointed, and about the thickneſs of a ſtraw. Above the mouth are two noſtrils, through which the animal ſpouts the water like a whale. There are a great number of morſes towards Spitzbergen, and the profit that is derived from their teeth and fat fully repays the trouble; for the oil is nearly of an equal value with that produced from the whale. When the huntſman is near one of theſe animals in the water, or on the ice, he darts a very ſtrong harpoon at it, which often ſlips over its hard and thick ſkin; but if it has penetrated into it, they haul the animal towards the boat, and kill it with a very ſharp and ſtrong lance. The morſe is generally heavier than the ox, and as difficult to purſue as the whale, the ſkin of which is more eaſily pierced, and a ſtrong and ſharp lance is often darted ſeveral times at the morſe without penetrating it. For this reaſon, they always endeavour to aim at its eyes. The animal, obliged by this motion to turn its head, expoſes its breaſt to the huntſman, who immediately ſtrikes it and retracts the lance as quick as poſſible, for fear it ſhould ſeize the lance with its teeth, and wound thoſe that attack it. Before theſe animals were ſo greatly perſecuted, they advanced ſo far on ſhore, that when it was high water, they were at a great diſtance from the ſea; and at low water, being at a ſtill greater, the huntſmen eaſily killed great numbers of them. The huntſmen, in order to cut off their retreat to the ſea, and after they had killed ſeveral, made a kind of barrier of their dead bodies, and in this manner, often killed three or four hundred, in a ſeaſon. The prodigious quantity of bones to be found on the ſhores, ſufficiently prove how numerous theſe animals were in former times. When they are wounded, they become extremely furious, often biting the lances in pieces with their teeth, or tearing them out of the hands of their enemies. At laſt however, when they are ſtrongly engaged, they put their head betwixt their paws, or fins, and in this manner roll into the ſea. When there is a great number together, they are ſo bold as to attack the boats that purſue them, to bite them with their teeth, and to exert all their ſtrength to overturn them."

We find the morſe can live, at leaſt for ſome time, in a temperate climate. We do not know how long it goes with young, but if we judge by the time of its growth and ſize, we may ſuppoſe it to be above nine months. The morſe cannot continue in the water for a long time together, and is obliged to go on ſhore to ſuckle its young, and for other occaſions. When they meet with a ſteep ſhore, or pieces of ice to climb up, they make uſe of their tuſks to hold by, and their feet to drag along the heavy maſs of their body. They are ſaid to feed upon the ſhell-fiſh which are at the bottom of the ſea, and to grub them up with their ſtrong tuſhs. Others ſay, that they live on the broad-leaves of a certain vegetable which grows in the ſea, and that they eat neither fleſh nor fiſh. But I imagine, that the morſe, like the ſeal, lives on prey, eſpecially herring and other fiſh; for it does not eat when upon land, and it is chiefly hunger which obliges it to return to the ſea.

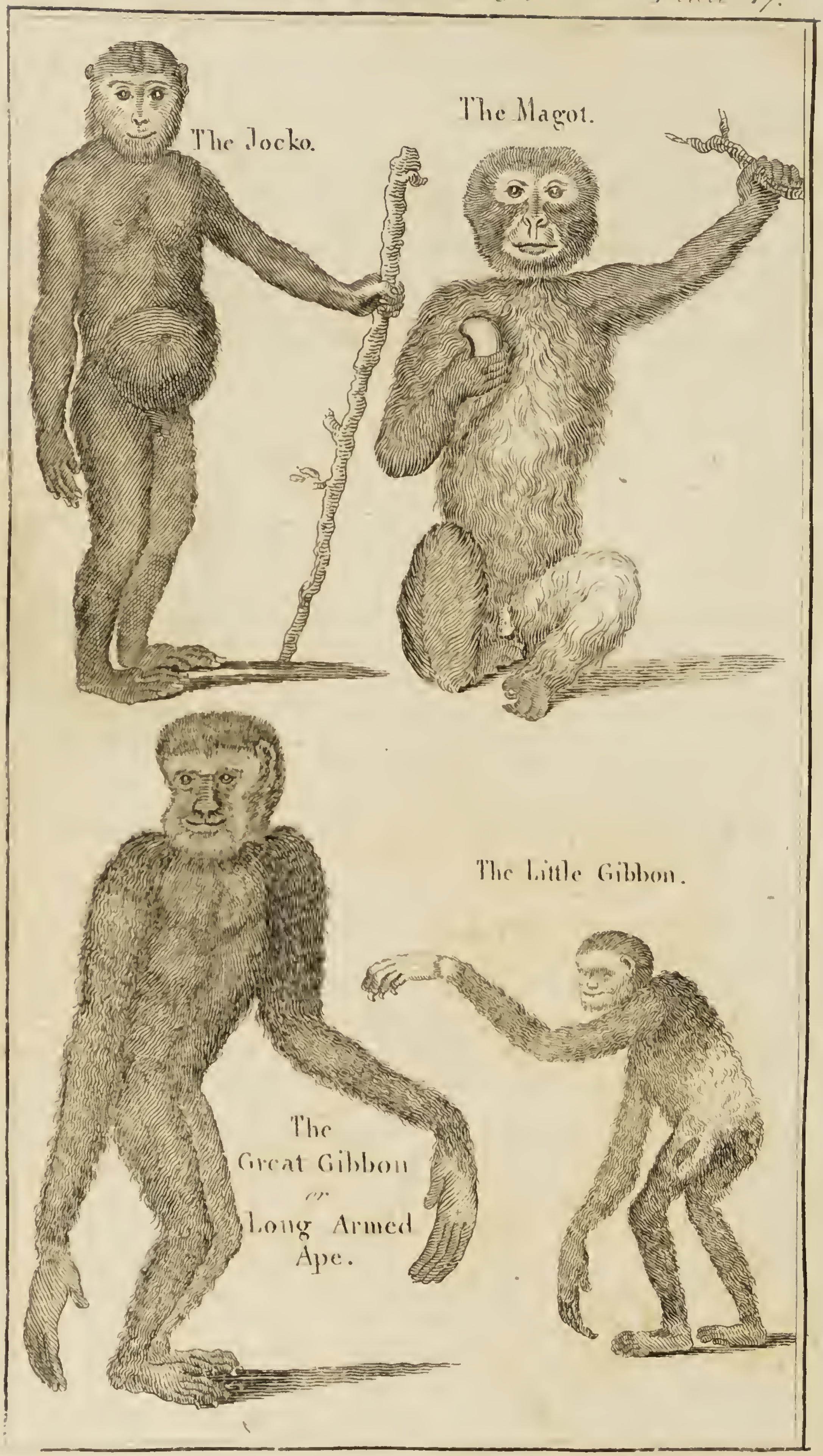
The Dugon.

The dugon is an animal which inhabits the African and Indian ſeas. Some travellers have confounded it with the ſea lion, and other travellers ſeem to have pointed it out by the name of the ſea bear; Spilberg and Mandelſo relate, "that there are animals on the iſland of St Elizabeth, on the coaſt of Africa, which ſhould rather be denominated ſea bears than ſea wolves, as their hair, colour and head, greatly reſemble thoſe of that animal; the ſnout only being more pointed. They alſo move alike with their fore legs, but drag the hind ones after them. In other reſpects theſe amphibious animals have a frightful appearance, and do not ſhew any fear at the ſight of man. Their teeth are ſo very ſtrong, as to enable them to bite through the ſtock of an halberd, and although their hind legs appear crippled, yet they are able to move with ſuch ſwiftneſs, that it is very difficult to overtake them." "Le Guat alſo ſpeaks of having ſeen a ſea cow of a reddiſh colour, near the Cape of Good Hope; its body was round and thick, its eyes full and large, its teeth or long tuſks, and its muzzle were turned a little upwards."

The Manati.

This animal may be indiſcriminately called the laſt of beaſts or the firſt of fiſhes. It can neither be called a quadruped nor a fiſh. It partakes of the fiſh by its two feet or hands, but it has no hind legs. Inſtead of two ſhort feet and a ſmall narrow tail, which is placed in an horizontal direction in the morſe, the manati has only a thick tail, ſpread out broad like a fan. Oviedo ſeems to be the firſt who has given any ſort of hiſtory or deſcription of the manati: he ſays, "it is a very clumſy and miſhapen animal, the head of which is thicker than that of an ox, the eyes ſmall, and the two feet or hands are placed near the head for the purpoſe of ſwimming. It has no ſcales, but it is covered with a ſkin or rather a thick hide with a few hairs or briſtles: it is a quiet animal, and feeds upon the herbage by the river ſides, without entirely leaving the water, ſwimming on the ſurface of it to ſeek its food. The huntſmen practiſe the following method to take the manati; they row themſelves in a boat or raft as near the animal as poſſible, and dart a very ſtrong lance into it, to the end of which a very long cord is faſtened. The manati feeling itſelf wounded, inſtantly ſwims away, or plunges to the bottom. The cord however, which holds the lance, has a cork or piece of wood faſtened to the end of it, to ſerve as a buoy. When the animal begins to grow faint and weak through the loſs of blood, it ſwims to ſhore. The cord is then wound up, and the animal drawn near to the boat, where they diſpatch it in the water by ſtrokes of the oar or lance. It is ſo very heavy, as to be a ſufficient load for two oxen to draw; its fleſh is very good, which they eat rather as beef, than as fiſh. Some of theſe animals are above fifteen feet long by ſix broad. The body becomes narrower towards the tail, and then ſpreads gradually broader towards the end. As the Spaniards, adds Oviedo, give the appellation of hands to the feet of quadrupeds, and as this animal has only fore feet, they have given it the name of *manati*, i. e. an animal with hands. The female has breaſts placed forward like thoſe of a woman, and ſhe generally brings forth two young ones at a time, which ſhe ſuckles. The fleſh and fat of this animal

MONKEYS. *Plate 17.*


The Jocko.
The Magot.
The Little Gibbon.
The Great Gibbon or Long Armed Ape.

I. Fraſer Sc.

(ſays M. de Condamine) are very like veal. It is not, properly ſpeaking, amphibious; for it never leaves the water entirely, having only two flat fins, cloſe to the head, about ſixteen inches long, and which ſerve it inſtead of arms and hands. It only raiſes its head out of the water to feed on the herbage by the ſea-ſide. Its eyes have no proportion to the ſize of its body; the orifice of its ears is ſtill leſs, and only ſeems like a hole made by a pin. The manati is not peculiar to the Amazonian river; for it is not leſs common in Oroonoko. It is found alſo, though leſs frequently, in the Oyapoc, and many other rivers in the environs of Cayen, and the Coaſt of Guiana, and probably, in other parts."

The manati ſpecies, however, is not confined to the ſeas and rivers of the New World, but is alſo found in thoſe of Africa

CHAP. XXI.

OF MONKIES—THE ORANG-OUTANG—THE PIGMY—THE GIBBON, OR LONG-ARMED APE—THE MAGOT.—THE BABOON—THE MANDRIL.—THE WANDEROW AND LOWANDO—THE MAIMON.—THE MACCACO AND EGRET—THE PATAS—THE MALBROUCK AND CHINESE BONNET—THE MANGEABY—THE MONA—THE CALLITRIX—THE MUSTACHE—THE TALAPOIN—THE DOUC—AMERICAN MONKIES—THE WARINE AND ALOUATTA—THE COAITA AND EXQUIMA—THE CAPUCHIN MONKEY—THE WEEPER—THE ORANGE MONKEY—THE SUKI—THE TAMARIM—THE WESTITI—MARIKINE—THE PINCH—THE MICO.

The Orang-outang, or the Pongo and the Jocko.

THIS animal is called orang-outang in the Eaſt Indies; *Pongo*, at Louando, a province of Congo; and Kukurlacks in ſome parts of the Eaſt Indies. We ſhall preſent the orang-outang and the jocko together, becauſe they are, probably, but the ſame ſpecies. We have ſeen the ſmall orang-outang, or the jocko, alive, and we have preſerved its ſkin, but we can only ſpeak of the pongo, or great orang-outang, from the accounts travellers have given us of it. Battel aſſures us, "that, except his ſize, the pongo is exactly like a man in all his proportions. He is as tall (he ſays) as a giant: his face is like that of a man, the eyes deep ſunk in the head, the hair on each ſide extremely long, the viſage, the ears and hands, are without hair. The body is lightly covered, and ſcarcely differing from that of a man, except that there are no calves to the legs. Still, however, the animal, is ſeen to walk on his hinder legs. He ſleeps under trees, and builds himſelf a hut, which ſerves to protect him againſt the ſun and the rains of the tropical climates, of which he is a native. He lives only upon fruits, and is not carnivorous. He cannot ſpeak, although furniſhed with greater inſtinct than any other animal of the brute creation. When the Negroes make a fire in the woods, this animal comes near and warms himſelf by the blaze. He has not, however, ſkill enough to keep the flame alive by feeding it with fuel. They go together in companies, and if they happen to meet with one of the human ſpecies, remote from ſuccour, they ſhew him no mercy. They even attack the elephant, which they beat with their clubs, and oblige to leave that part of the foreſt which they claim as their own. It is impoſſible to take any of theſe creatures alive, they are ſo ſtrong. None of this kind, therefore, are taken, except when very young, and then only when the female happens to leave them behind; for, in general, they cling to the breaſt both with legs and arms. There are two kinds of this animal both very like the human race, the pongo, which is larger than a man; and the jocko, which is far leſs. The apes of Guinea, (ſays Boſman) which are called *Smitten* by the Flemings, are of a brown colour, and grow to a very large ſize. I have ſeen ſome above five feet tall. Theſe apes are of a very diſagreeable appearance, as well as thoſe of another kind, which reſemble them in every particular, except in ſize, which is a fourth part leſs than that of the former. They are very eaſily taught to do almoſt whatever their maſters pleaſe." Schouten ſays, "That the animals which the Indians call orang-outangs, are almoſt all of the ſame ſize and ſhape as men, but that their back and loins are covered with hair, of which however there is a deficiency in the fore part of the body. The ſame author adds that the females have two breaſts; that the face is rough, the noſe flat, and the ears like thoſe of a man; that they are robuſt, active, bold, and defend themſelves even againſt armed men; that they are paſſionately fond of women. Hence the fair ſex ſhould not paſs through the wood which they inhabit, as theſe animals immediately attack and injure them." To theſe teſtimonies we may add that M. de la Breſſe, mentioned in his Voyage to Anjou. This traveller aſſures us, "that the orang-outangs, which he calls *Quimpeazes* often attempt to ſurprize the female negroes. I knew (ſays he) a woman of Louango that had lived among theſe animals for three years. They grow from ſix to ſeven feet high, and are of unequalled ſtrength. They build ſheds and make uſe of clubs for their defence. Their faces are broad, their noſes flat, their ears without a tip, their ſkins are fairer than thoſe of Mulattoes, but they are covered on many parts of their body with long and tawny-coloured hair. Their belly is extremely large, their heels flat, and yet riſing behind about half an inch: they ſometimes walk erect, and ſometimes upon all four when they are phantaſtically diſpoſed. We purchaſed two of them, a male about fourteen months old, and a female about twelve."

The orang-outang which I ſaw, walked always erect, even when it carried heavy burthens. Its air was melancholy, its deportment grave, its nature more gentle and very different from that of other apes. Unlike the baboon, or the monkey, whoſe motions are violent, and appetites capricious; who are fond of miſchief, and only obedient through fear, a look was ſufficient to keep it in awe. I have ſeen it ſhow the company to the door, that come to ſee it, and it would walk about gravely with them, as if one of them. I have ſeen it ſit at table, unfold its napkin, wipe its lips, make uſe of the ſpoon and the fork to convey the victuals to its mouth, pour out its drink into a glaſs, touch glaſſes when invited, take a cup and ſaucer and lay on the table, put in ſugar, pour out its tea, and leave it to cool before drinking. It was gentle and inoffenſive. It even approached ſtrangers with reſpect, and came rather to receive careſſes than to offer injuries. It ate almoſt of every thing that was offered to it, but it preferred dry and ripe fruits to every thing elſe. It would drink wine, but in ſmall quantities, and willingly left it for milk, or any other ſweet liquor. Mr L. Broſſe, who bought two young ones that were but a year old from a negro, relates that, "even at that age they ſat at table, ate of every thing without diſtinction, made uſe of their knife, ſpoon, and fork. They drank wine and other liquors. We carried them on ſhip-board, and when they were at table, they made ſigns to the cabin-boys expreſſive of their wants. Whenever they neglected attending upon them as they deſired, they inſtantly flew into a paſſion, ſeized them by the arm, bit them, and kept them down. The male was ſea ſick, and required attendance like an human creature: blood was twice let in his right arm; and every time afterwards when he found himſelf indiſpoſed, he ſhewed his arm, as if deſirous of being relieved by bleeding."

Henry Groſe relates, "that theſe animals are met with to the north of Coromandel; that Mr Horne, governor of Bombay had two of them ſent him, a male and a female. They were ſcarcely two feet high, but their form was entirely like the human. They walked erect upon their two feet, and were of a pale colour, without any hairs on any other part than where mankind generally have them. Their actions perfectly reſembled thoſe of men, and their melancholy plainly evinced how ſtrongly they felt the weight of their captivity. They made their bed very carefully in the cage in which they were ſent on board the ſhip. When any perſon looked at them, they hid thoſe parts with their hands, which modeſty dictates to conceal. The female (adds he) died on board, and the male was ſo ſincerely affected, that he refuſed his food, and did not ſurvive her above two days."

Francis Pyrard relates, "that in the province of Sierra Leona, in Africa, there are a kind of apes called *Barris*, which are ſtrong and muſcular, and ſo very induſtrious, that, if properly fed and inſtructed when young, they ſerve as very uſeful domeſtics. They uſually walk upright, will pound at the mortar, draw water from the river in a little pitcher, which they carry on their heads; but, if care be not taken to receive the pitcher at their return, they let it fall to the ground, and then, ſeeing it broken, they begin to lament the loſs."

The Pithecos or Pigmy.

From the teſtimony of the ancients, the pithecos was the moſt gentle and docile of all the monkey kind that was known to them. It was common in Aſia, as well as in Lybia, and in the other provinces of Africa, frequented by the Greek and Roman travellers. And this has inclined me to think, that we muſt refer the animals mentioned by Leo the African, and Marmot, to this kind. "Theſe animals (ſays Marmot) have feet and hands, and if I may be allowed the expreſſion, a human face, with an appearance of much vivacity and malice. They live upon corn, herbage, and all ſorts of fruits; to obtain which they ſally forth in large bodies, and plunder the gardens or villages. Before they venture out on this expedition, one of the company aſcends an eminence, and ſurveys the environs. If there is no appearance of any perſon near, he makes ſigns to his companions to enter the vineyard or orchard, and begin their plunder: but as ſoon as the centinel perceives any body coming, he inſtantly ſets up a loud cry, and the whole company ſcampers off with the utmoſt precipitation, and jumping from tree to tree, retreat to the mountains. It is a great curioſity to ſee theſe animals retreat; for the females carry four or five young ones upon their backs, and with this heavy load leap with great agility from branch to branch, though great numbers of them are taken notwithſtanding all their cunning. When they are angry, they bite; but while they are coaxed, they are very tame. Thoſe that are tamed, perform wonders, and imitate mankind in almoſt whatever they ſee them do." The pithecos has no tail; its canine teeth are not proportionably longer than thoſe of mankind; its face is flat, as is likewiſe its nails, which are rounded at top, like thoſe of a man; it walks erect, is about a cubit high, and of a gentle and tractable diſpoſition.

The Gibbon, or Long-armed Ape.

The gibbon always is erect, even when it walks upon all fours, its arms being as long as both its body and legs. We have ſeen one of theſe animals alive; it was but young, and not above three feet high; though we muſt preſume, that it had not attained its full ſize, but that when it is adult, and in its free ſtate, it is at leaſt four feet. It had no appearance of any tail: it had a circle of grey buſhy hair round the face, which gave it a very remarkable appearance. Its eyes were large and ſunk in its head; its face was ſomewhat like that of a man, and its ears were well proportioned. This ape appeared to us to be of a gentle and tractable diſpoſition; its motions were neither raſh, nor precipitate. It was fed on bread, fruit, almonds, &c. and calmly received the food that was preſented to it: it was very averſe to cold and wet weather, and did not live long after being brought from its native country. It is a native of the Eaſt-Indies, and almoſt peculiar to the coaſts of Coromandel, Malacca, and the Molucca iſlands.

The Magot.

Of all the apes which have no tail, this animal can beſt endure the temperature of our climate. We have kept one theſe many years. In the ſummer, it remained in the open air with pleaſure; and in the winter, might be kept in a room without any fire.

It was filthy, and of a ſullen diſpoſition. It equally made uſe of grimace to ſhew its anger, or expreſs its ſenſe of hunger. Its motions were violent, its manners awkward, and its phiſiognomy rather ugly than ridiculous. Whenever it was offended, it grinned and ſhewed its teeth. It put whatever was given to it into the pouches on each ſide of its jaws, and commonly eat every thing that was offered to it, except raw fleſh, cheeſe, and whatever was of a fermentive nature. When it ſlept, it was fond of rooſting on a wooden or iron bar. It was always kept chained, for, notwithſtanding its long ſubjection, it was neither civilized, nor fond of its keeper. It appeared to have been but badly educated, for I have ſeen others of the ſame kind who were more ſagacious, obedient, gayer, and ſo tractable as to be taught to dance, and ſuffer themſelves quietly to be clothed and dreſſed.

This ape is about two feet and an half, or three feet high, in its erect poſture; but the female is not ſo large as the male. It rather chuſes to walk on all fours, than erect. When it ſleeps, it is almoſt always ſitting. There are two very prominent calloſities on its poſteriors. It differs alſo from the *pithecos;* firſt, in the form of its ſnout, which is thicker and longer, like that of a dog; whereas, the pithecos has a flat viſage, like the human. Secondly, in having long canine teeth;

inſtead of which the pithecos has them no longer in proportion than thoſe of a man. Thirdly, in its nails, which are neither ſo flat nor ſo round; and, in ſhort, it is larger, and of a more ſullen and untractable diſpoſition than the other.

It is probably, this kind of monkey which Robert Lade ſpeaks of in the following terms: "We travelled over a great mountain at the Cape of Good Hope, where we diverted ourſelves with hunting the large apes, with which it abounds. I am not able to repreſent all the tractableneſs of theſe animals which purſued us, nor the ſwiftneſs and impudence with which they returned to us after we had driven them away. Sometimes they ſuffered us to approach ſo near them, that, ſtopping almoſt cloſe to one of them to take my obſervations, I thought myſelf certain of ſecuring him, when, taken a ſudden leap, he ſprang above ten paces from me, and climbed up a tree with the greateſt agility. They remained afterwards very quiet, and looked at us as if they were pleaſed with our aſtoniſhment. There were ſome ſo exceedingly large, that if they had been of a ferocious nature, our number would not have been ſufficient to ſecure us from their attacks. As it would have been needleſs to have killed theſe animals, we made no uſe of our guns; but the captain, thinking to wound one of them, which was ſeated on a tree, after a long purſuit, had no ſooner preſented his piece, but the animal, probably from the remembrance of the execution of ſome of his companions in the ſame manner, was ſo greatly terrified at it, that it fell almoſt motionleſs at our feet, and being ſtunned in the fall, we had not the leaſt trouble to ſecure it. When it revived, however, we had occaſion for all our ſtrength and addreſs to keep it, defending itſelf by biting thoſe who were near it, which obliged us to bind our handkerchiefs over its head."

The Baboon.

The Baboon, properly ſo called, has a pouch on each ſide of its cheeks. It has calloſities on its poſteriors, which are naked and of a red colour. Its tail is crooked and thick, and about ſeven or eight inches long. The canine teeth are much thicker and longer than thoſe of men. Its ſnout is very thick and very long; its ears naked: its body and limbs are ſtrong, thick, and ſhort. Its hair is long and thick, of a reddiſh brown colour, and pretty uniform over the whole body. It walks oftener on all fours than upright, and is from three to four feet high; but there ſeem to be different ſizes of theſe animals. The female brings forth uſually but one at a time, which ſhe carries in her arms, and in a peculiar manner clinging to her breaſt. In other reſpects, theſe baboons, although miſchievous and ferocious, are not carnivorous; for they feed principally upon fruits, roots, and corn; they generally herd together, and ſally forth to commit their depredations on the neighbouring vineyards, or orchards. "As they are extremely fond of grapes, apples, and ripe fruit, they aſſemble together in great numbers, and proceed on their enterprize with previous deliberation. The dogs that are ſet on watch, do not eaſily conquer theſe animals, as they are extremely active, and make dextrous uſe of their teeth and claws. On theſe occaſions, a part of them enter the incloſure, while one of the company ſtands centinel. The reſt ſtand without the fence, a ſmall diſtance from each other, and form a line, reaching all the way from the incloſure to the rendezvous without, which is generally in ſome craggy mountain. Every thing being thus diſpoſed, the plunderers within the orchard throw the fruit to them without as faſt as they can gather it. But if the wall or hedge be high, they heave it up to thoſe that ſit at the top, and theſe hand the plunder to thoſe next their ſide.

The Mandril.

This baboon is an ugly, diſguſting animal. Excluſive of its noſe it has two noſtrils, from which a thick matter continually iſſues. Its muzzle is ſtill longer than the preceding; it is of a blueiſh colour, and ſtrongly ſeamed with wrinkles, which ſtill increaſes its frightful and loathſome appearance.

This baboon is found on the Gold Coaſt, and in other ſouthern provinces of Africa, where the Negroes call it *Boggo*, and the Europeans *Mandril*. This animal is the largeſt of the baboon kind. Smith ſays, that a female mandril was given to him, which was not above ſix months old, and had then attained the ſize of an adult baboon. He likewiſe informs us, that theſe animals walk always erect; that they ſigh and cry, like the human ſpecies; that they have a violent paſſion for the female ſex; and that they never fail to overcome them, if they find them within their reach.

The Wanderow, and the Lowando.

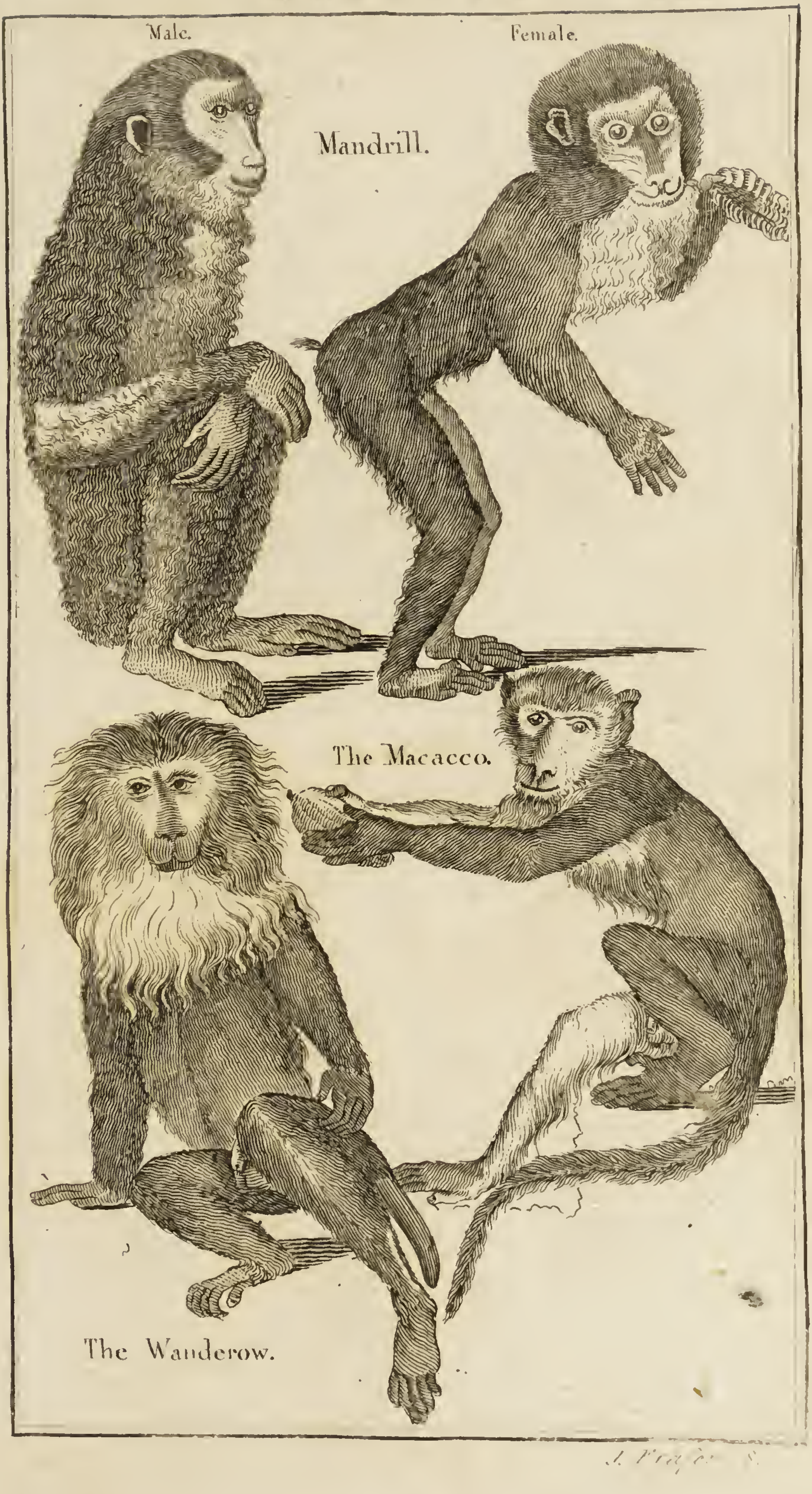
As theſe two animals ſeem to be but one ſpecies, we have, therefore, here preſerved the two names they bear in Ceylon, as they at leaſt form two diſtinct breeds. The body of the wanderow is covered with brown and black hairs, and has a long white head of hair, and a monſtrous white beard. The body of the lowando, on the contrary, is covered with whitiſh hairs, but has the like large head of hair and beard. There is ſtill a third variety found in the ſame country, which may, poſſibly, be the common ſtock of the other two, becauſe it is white over its body, with the like head of hair and beard. Theſe animals are baboons, and not, as ſome have imagined, monkeys, as they have all the characters, as well in ſhape as in diſpoſition, and are of the ſame ſavage nature, and even more ferocious.

" The white monkies (ſays Forbin) are ſometimes as big as the largeſt Engliſh maſtiff. They are more dangerous than the black. They principally attack women, and often, after having greatly injured them, finiſh their cruelty by ſtrangling. Sometimes they even come to their houſes; but the Macaroes, who are very jealous of their wives, take care to prevent their entrance into their habitations; and the females not liking (as the chevalier humorouſly relates) either the manners or the figure of the paltry gallants, boldly ſtand on their defence, and with clubs, or whatever other arms they can provide, inſtead of indulging their careſſes, oblige their ugly ſuitors to retreat.

The Maimon.

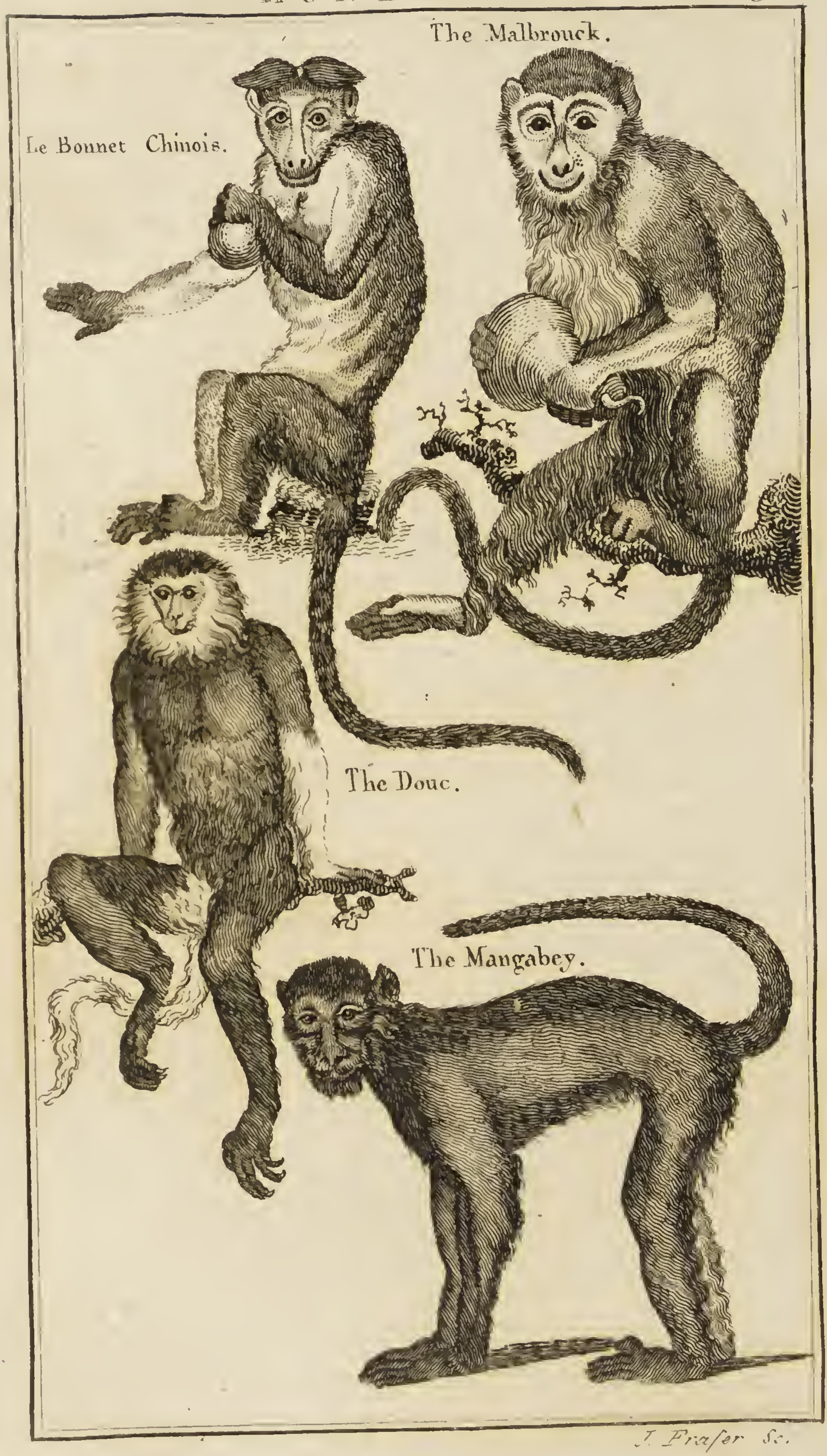
The maimon has pouches on each ſide of its cheeks, and calloſities on its poſteriors. Its tail is naked, curled up, and about the length of five or ſix inches: the canine teeth are not much longer in proportion than thoſe of men: the ſnout is very broad: the orbits of the eyes very acute above: the face, ears, hands, and feet, are naked, and of a fleſh colour: the hair of a dark olive on the body, and of a yellowiſh colour on the belly: it ſometimes walks erect, and at other times upon all fours: it is about two feet, or two feet and an half tall when erect.

MONKEYS. *Plate 18.*



J. Fraser sc.

MONKEYS. *Plate 19.*


The Malbrouck.
Le Bonnet Chinois.
The Douc.
The Mangabey.

J. Fraser Sc.

The Macacco, and the Egret.

Of all the apes, or monkies, with long tails, the macacco approaches neareſt the baboon; its body being ſhort and compact, like that animal. Its head thick, its ſnout broad, its noſe flat, its cheeks wrinkled, but it is bulkier and taller than moſt other monkies. It is alſo ſo very ugly, that it may well be looked upon as a ſmaller kind of the baboon, if it did not differ in the tail, which is crooked, but longer and tufted; whereas that of the baboon, is, for the moſt part, extremely ſhort. This ſpecies is a native of Congo, and other ſouthern parts of Africa. It is numerous, and ſubject to many varieties with reſpect to its ſize, colour, and diſpoſition of the hair. The body of that deſcribed by Haſſelquiſt, was more than two feet long; and thoſe which we have ſeen, were not above one foot and an half. That which we here term the *Egret*, becauſe of the plume on its head, ſeems to be only a variety of the firſt, which it perfectly reſembles, except the difference before mentioned, and ſome other ſlight varieties in the hair. Both of them are tractable and docile; but, independent of the ſcent which they diffuſe around them, they are ſo miſhapen, and even ſo hideous that they are real objects of horror and diſguſt. Theſe monkies go in flocks. Baſman relates, that they take a melon in one of their hands, another under their arms, and one in their mouths, which they carry off. If the purſuit is hot, they drop firſt that from under their arm, then that from their hand; and if it be continued, they at laſt let fall that which they had hitherto kept in their mouths. In other reſpects, ſays this traveller, they examine the melon beds carefully, and what does not pleaſe them they throw away, and tear up others. Hence they greatly injure many of the orchards and vineyards by their depredations.

The Patas.

The Patas, is a native of the ſame country, and is nearly of the ſame ſize as the macacco, the body being only ſomewhat longer, the face not ſo ugly, and the hair fairer. It is, indeed, of ſo brilliant a red, that the animal looks as if it were painted. I am inclined to think, that the monkey ſpoken of by Marmot, and ſaid to be of the colour of the wild cat, and to be a native of Africa, is only a variety in the patas ſpecies. Theſe animals are not ſo ſubtle as others of their kind, but are poſſeſſed of an extreme curioſity. "I have ſeen them (ſays Bruce) deſcend from the top to the branches of very high trees, to view the veſſels on the water, which they admired for ſome time, and ſeemed diverted with what they had ſeen. After this they quitted their ſtations for their companions to have the ſame ſight. Some even threw the branches of the trees at the French, who returned their ſalute with a muſket ball; ſome were killed, others wounded, and others fell to the ground in the utmoſt conſternation. One part uttered moſt hideous cries, while another was picking up ſtones to throw at their enemies, and a third were occupied in the eaſing of nature into their hands, which they inſtantly diſcharged againſt the ſpectators; but perceiving at length, how unequal the battle was, they deſiſted, and prudently retreated."

The Malbrouck, and the Chineſe Bonnet.

Theſe two monkies, or apes, with a long tail, ſeem to belong to one ſpecies; and this ſpecies, although ſomewhat different from that of the macacco, ſtill gives us reaſon to ſuppoſe the macacco, egret, malbrouck, and the bonet chinois, to be only four varieties.

Theſe animals are found in Bengal, where travellers informs us, they plunder whole fields of grain, and plantations of ſugar canes; and whilſt one ſtands centinel on a tree, the others load themſelves with the booty. But if the owner of the field, or plantations, appear to interrupt their depredations, their faithful companion on the look out, gives notice by crying out *houp*, *houp*, *houp*, which the reſt perfectly underſtand. Upon this they throw down their plunder, which they hold in their left hands, ſcamper off on their three legs, holding the remainder in their right, and ſave themſelves from their purſuers by climbing up trees, where they have their general abode. The females, even loaded with their young ones, claſp them cloſe to their breaſt, leap like the others from branch to branch, and eſcape with the reſt. When they cannot find any proviſion in the fields, they get on the tops of houſes, and having pulled off the tiles, do great damage to the inſide. They do not eat a ſingle thing without ſmelling it for a long time before hand, and when they have ſatisfied their hunger, they put the remainder in the pouches on the ſides of their cheeks for the next day. They deſtroy the neſts of birds, and never fail to throw the eggs on the ground when they want appetite or inclination to eat them.

The moſt formidable enemy theſe animals have, is the ſerpent, no other animal of the foreſt being able to ſurprize them, as they are ſo exceedingly ſwift and ſubtle, and eaſily climb up and ſeat themſelves on the tops of the higheſt trees. The monkey, ſays a traveller, "has in its power to be maſter of the foreſt, for there are neither tygers nor lions which can diſpute the poſſeſſion with it. The chief animal it has to fear, and which attack them both night and day is the ſnake. There are ſome ſnakes in thoſe foreſts of a prodigious ſize, which wind up the trees where the monkies reſide, and when they happen to ſurprize them ſleeping, devour them in an inſtant."

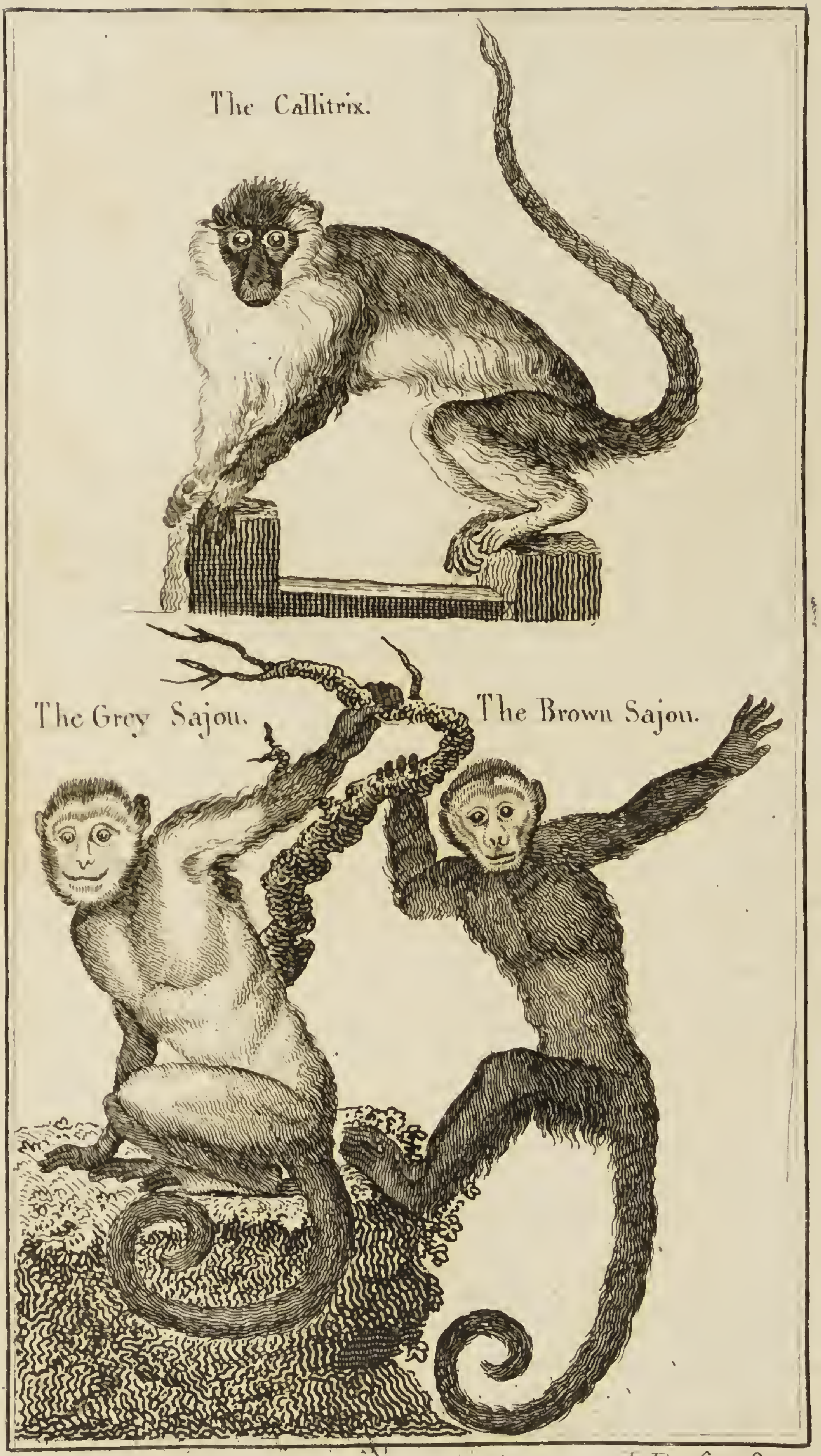
The malbrouck has pouches on each ſide of its cheeks, and calloſities on its poſteriors: its tail is very near as long as the body and head put together. The eyelids are of a fleſhy, and the face of an aſh colour; the ears are large, thin, and of a fleſh colour. They have a ſtripe of grey hairs on them like the mona; but in other parts they are of an uniform colour, approaching towards a brown on the upper parts of the body, and towards a grey on the lower. It goes on all fours, and is about a foot or a foot and an half long from the ſnout to the inſertion of the tail.

The chineſe bonnet ſeems to be a variety of the malbrouck. It differs from it however, in the hair on the crown of its head, which is diſpoſed in the ſhape of a cap or flat bonnet, and in its tail, which is large.

The Mangabey.

We have ſeen two of this kind, both of which were ſent to us by the denomination of *Madagaſcar monkies*. The mangabey has its eyelids naked, and of a ſtriking whiteneſs. It has pouches on each ſide of its cheeks, and calloſities on its poſteriors. Its tail is as long as the head and body put together, and it has a prominent roll of hair over its eyes. Its ſnout is thick and long, its eyebrows rough and briſtly; its ears black and almoſt naked. The hair of the upper parts of its body is brown

MONKEYS. *Plate* 20.


The Callitrix.
The Grey Sajou.
The Brown Sajou.

J. Fraſer Sc.

brown and thoſe below are grey. There is a variety in this ſpecies, ſome being of an uniform colour, and the others having a circle of white hair round the neck, and the form of a beard round their jaws. They walk on all fours, and are near a foot and an half long from the ſnout to the tail.

The Mona, or varied monkey.

The mona, or varied monkey, is the moſt common of the monkey tribe. We kept one of them alive ſeveral years. This alone is ſufficient to prove it is not a native of the hot countries of Africa and India. In fact, it is met with in Barbary, Arabia, Perſia. &c. The viſage of this animal is of a brown hue, with a kind of white beard, mixt with yellow and a little black. The back is red and black; the belly and the hind parts of the thighs and legs whitiſh, though the fore parts of the two laſt are of a black colour. The tail is of an aſh colour, marked with two white ſpots, one on each ſide, at its inſertion. On its forehead the hair is of a grey colour, in the form of a creſcent, and between the eyes and the ears is a black ſtripe, as there is from the ears to the ſhoulders and arms.

The monkey is for the moſt part far more docile than the baboon, and not ſo ſullen as the ape. It is extravagantly ſpirited, but not ferocious. The mona is in particular ſuſceptible of education, and even attached to thoſe perſons who take care of it. The one which we reared would ſuffer itſelf to be handled by thoſe it knew, but would often bite ſtrangers. It was chained, but was deſirous of its liberty; for, when it either broke its chain, or got looſe, it would run away, and would not ſuffer itſelf to be re-taken by any other perſon than its maſter. It ate every thing that was offered to it, eſpecially fleſh, bread, and its favourite food, fruits. The mona is about a foot and a half long.

To the animals which we have juſt deſcribed, may be added,

The Callitrix, or Green monkey.

The callitrix, or green monkey, which is of a beautiful green colour, with a black face. He is found in Mauritania, Senegal, Cape de Verd, &c. and is about 15 inches long.

The Muſtache, or white Noſe.

It has always two tufts of yellow under the ears, which give it a ſingular appearance. Its body is of a greeniſh aſh colour; it is not above 13 inches long, and is a native of Guinea.

The Talapoin.

The talapoin, which is a native of India. Its colour is a mixture of duſky green and yellow; and it is about 17 inches.

The Douc.

The douc, has a long tail, but is diſtinguiſhed from all the monkeys of the Old World by having hair on its buttocks. Its colour is varied. Round its neck there is a purple collar; a white beard ſurrounds its cheeks; its face and ears are red; the top of its head and body, are grey; the breaſt and belly, yellow. It is about 4 feet long.

Of the Monkey Tribe in America.

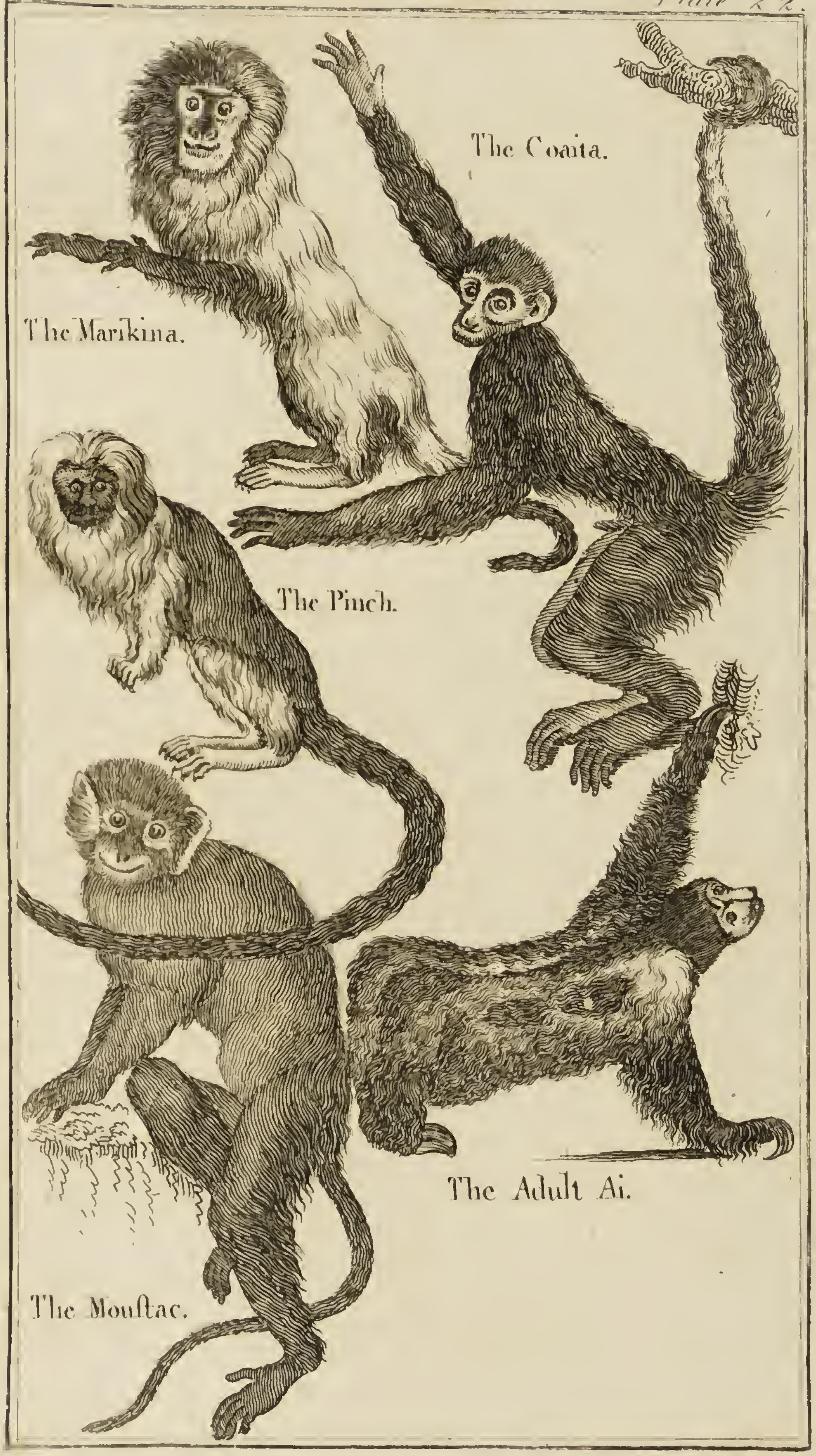
All the four-handed animals which we have given a deſcription of, and which we have comprehended under the generic names of Apes, Baboons, and Monkies, belong to the Old Continent only. All thoſe which remain to be ſpoken of, are, on the contrary, only found in the

New World. We here diſtinguiſh them by two generic names, as we can divide them into two claſſes; the firſt into that of the Sapajou, and the ſecond into the Sagoin. Both theſe animals have their feet nearly like thoſe of the ape and monkey kind, but they differ from the ape in having tails. The ſapajou has a very long tail, which it makes uſe of to ſeize and lay hold of things, and by which it ſuſpends itſelf from the branches of trees. The tail of the ſagoin, on the contrary, is longer than that of the ſapajou, but is weak and ſtrait. Hence they cannot make uſe of it either to lay hold of any thing, or for the purpoſe of climbing. This difference is ſo very apparent, that it is alone ſufficient to diſtinguiſh the ſapajou from the ſagoin.

The Warine and the Allouatto.

The warine and the alouatto are the largeſt of theſe animals belonging to the New Continent: they are larger than the largeſt monkey, and approach the ſize of the baboon. They have a long tail, and are, likewiſe, of the ſapajou family, in which they hold a very diſtinct rank, not only with regard to ſize, but alſo with reſpect to voice, which ſounds like a drum, and may be heard at a very great diſtance. "Marcgrave informs us, that every morning and evening the *warines* and the *alouattos* aſſemble in the woods; that one among them ſeats himſelf on an elevated place, makes a ſign with his hand to the reſt to ſeat themſelves round him. As ſoon as he ſees them all ſeated, he begins an oration with ſo quick and loud a voice, that, at a diſtance, it might be imagined they were all making a noiſe together. During the whole diſcourſe the reſt keep a profound ſilence, and when it is ended, he makes a ſignal to the reſt to anſwer him. Upon this they all ſet up a cry together, till by another ſign with his hand, he orders them to be ſilent: when they are immediately obedient and quiet. Then the firſt renews his diſcourſe, or his ſong, which, when finiſhed, and the others have paid the utmoſt attention to it, the whole aſſembly breaks up and ſeparates." "According to the ſame author, the face of the *warine* is broad, the eyes black and ſparkling, the ears ſhort and round, the tail naked at the extremity, with which it holds firmly whatever it encircles. The hair of the body is black, long, and gloſſy; it is much longer under the chin, which forms a kind of round beard. The hair on the hands, feet, and a part of the tail, is brown. The male is of the ſame colour as the female, and only differs from it in being a little larger. The females carry their young on their backs, and thus loaded, leap from branch to branch, and from tree to tree. The young one claſps the narroweſt part of the body of the dam with its hands and arms, and thus holds itſelf firmly faſtened. In other reſpects, theſe animals are wild and miſchievous; they can neither be tamed nor ſubdued, and they bite dreadfully. As they live only on fruit, grain, and ſome inſects, their fleſh is not unpalatable. It is like that of the hare, but a little ſweetiſh. The fat is yellow, like that of the capon, and of a very fine flavour. They eaſily faſten upon the branches of trees, and ſtick either by their hands, feet, or tail, wherever they touch. This renders it very difficult to take them, even after they are ſhot, for if they are only wounded, they will not fall to the ground, but cling to ſome branch, and remain on the tree where they are ſhot, till they drop off by putrefaction. What appears ſingular is, that the moment one of them is wounded, the reſt aſſemble round, and clap their fingers into the wound,

MONKEYS. *Plate 22.*


The Coaita.
The Marikina.
The Pinch.
The Adult Ai.
The Mouſtac.

wound, as if they were deſirous of ſounding its depth. If it be deep, they keep it ſhut up, while others get leaves, which they, chew and thruſt into the orifice. The females only bringing forth one at a time."

The alouatto has the ſame characters as the warine, and only ſeems to differ from it in having no beard, and a reddiſh-coloured hair, whereas, that of the warine is black.

The Coaita and the Exquima.

Next to the warine and the alouatto, the coaita is the largeſt of the ſapajous. I ſaw one alive at the Duke of Bouillon's, where, by its familiarity and forward careſſes, it merited the affection of thoſe who had it under their care; but in ſpite of the good treatment and attention paid to it, it could not reſiſt the winter of 1764. It differs greatly in diſpoſition from the warine and the alouatto, which are wild and untameable. It alſo differs from them in having but four fingers and no thumb to the fore paws. By this, and its tail, it is eaſily diſtinguiſhed from the monkey kind.

The animal which Marcgrave calls *Exquima*, is of nearly the ſame ſpecies with the *coaita*, and, perhaps, is only a variety of it. I have learned, that there are both black and white coaitas, the one beardleſs, and the others with a beard. " There is (ſays Dampier) in the Iſthmus of America, great numbers of monkies, ſome of which are white, but the moſt part black—ſome have beards, others none. Theſe monkies are very droll, and performed a thouſand groteſque poſtures as we traverſed the woods. When they are unable to leap from one tree to another, on account of the diſtance, their dexterity is very ſurprizing. The whole family form a kind of chain, locking tail in tail, or hand in hand, and one of them holding the branch above, the reſt ſwing down, balancing like a pendulum, until the undermoſt is enabled to catch hold of the lower branches of ſome neighbouring tree. When the hold is fixed below, the monkey lets go that which was above, and thus comes undermoſt in turn; but, creeping up along the chain, attains the next branches, like the reſt; and thus, they all take poſſeſſion of the tree without ever coming to the ground."

They have the addreſs to break the ſhell of the oyſters to eat them. They generally produce only one or two young at a time, which they carry upon their backs: they feed upon fiſh, worms, and inſects, but fruit is their general food, and they grow fat when it is ripe. Their fleſh is then ſaid to be exquiſite.

The coaita is about a foot and an half long, and its tail is longer than the head and body meaſured together: it goes on all fours.

The exquima is nearly of the ſame ſize with the coaita: it has not, however, black hair over all the body, but it varies in its colour. There are ſome black and brown on the back, and white on the belly, with a very remarkable beard.

The Sajou, or Capuchin Monkey.

We are acquainted with two varieties in this ſpecies; the brown ſajou, commonly called the *Capuchin Monkey;* and the grey ſajou, which only differs from the other in the colour of its hair. They are both lively, active, and very pleaſing by their tricks and nimbleneſs. They are, however, fantaſtical in their taſtes and affections: they ſeem to have a ſtrong affection for ſome people, and as great an averſion at others.

The Sai, or Weeper.

We have ſeen two of theſe animals, which ſeem to make a variety in the ſpecies. The hair of the firſt is of a deep brown colour; the hair of the ſecond, which we have called the *White throated Sai*, is white on the breaſt, neck, ears, and jaws. Travellers have denominated theſe animals *Howlers*, from their plaintive moan. Others have called them *Muſk Monkies*, from their having like the macacco, that peculiar ſmell. They belong to the ſapajou family, as they have a holding tail: they have only two teats, and bring forth but one or two at a time. They are gentle, docile, and ſo timorous, that their common cry, which reſembles that of a cat, is dwindled down to a kind of ſighing when they are threatned. Their food, in this climate, is principally ſnails and beetles, which they prefer before any other. In their native country of Braſil, however, they live chiefly upon grain, and the wild fruit they pluck from trees, whence they very ſeldom deſcend, till they have ſtripped their habitation of its treaſure.

The Saimiri.

The Saimiri is commonly known by the name of the *Golden, Orange-coloured*, or *Yellow Sapajou*. It is frequent in Guiana. By its air, ſize, the brilliant colour of its coat, fulneſs and brightneſs of its eyes, and its ſmall, round viſage, the ſaimiri has ever taken the lead of every other ſapajou. It is, in fact, the moſt beautiful and delicate of the kind, and the moſt difficult to tranſport and preſerve in other countries. Its tail, without being abſolutely uſeleſs and weak, like that of the ſagoin, is alſo not ſo muſcular as that of the ſapajou. Its tail may be ſaid to be but half-holding; and though it uſes it in climbing trees, yet it can neither ſtrongly hold, nor firmly fix itſelf with it. It is ſcarcely more than ten or eleven inches. It ſits long erect on its hinder feet with great eaſe; but it walks commonly on all fours.

The Saki.

The Saki, commonly called the *Fox-tailed Monkey*, from its tail being clothed with very long hair, is the largeſt of the ſagoin kind, being about ſeventeen inches long. The ſize of the five other ſagoins on the other hand, is not above nine or ten. The ſaki has very long hair on its body, and ſtill longer on its tail. Its face is red, and covered with a whitiſh down.

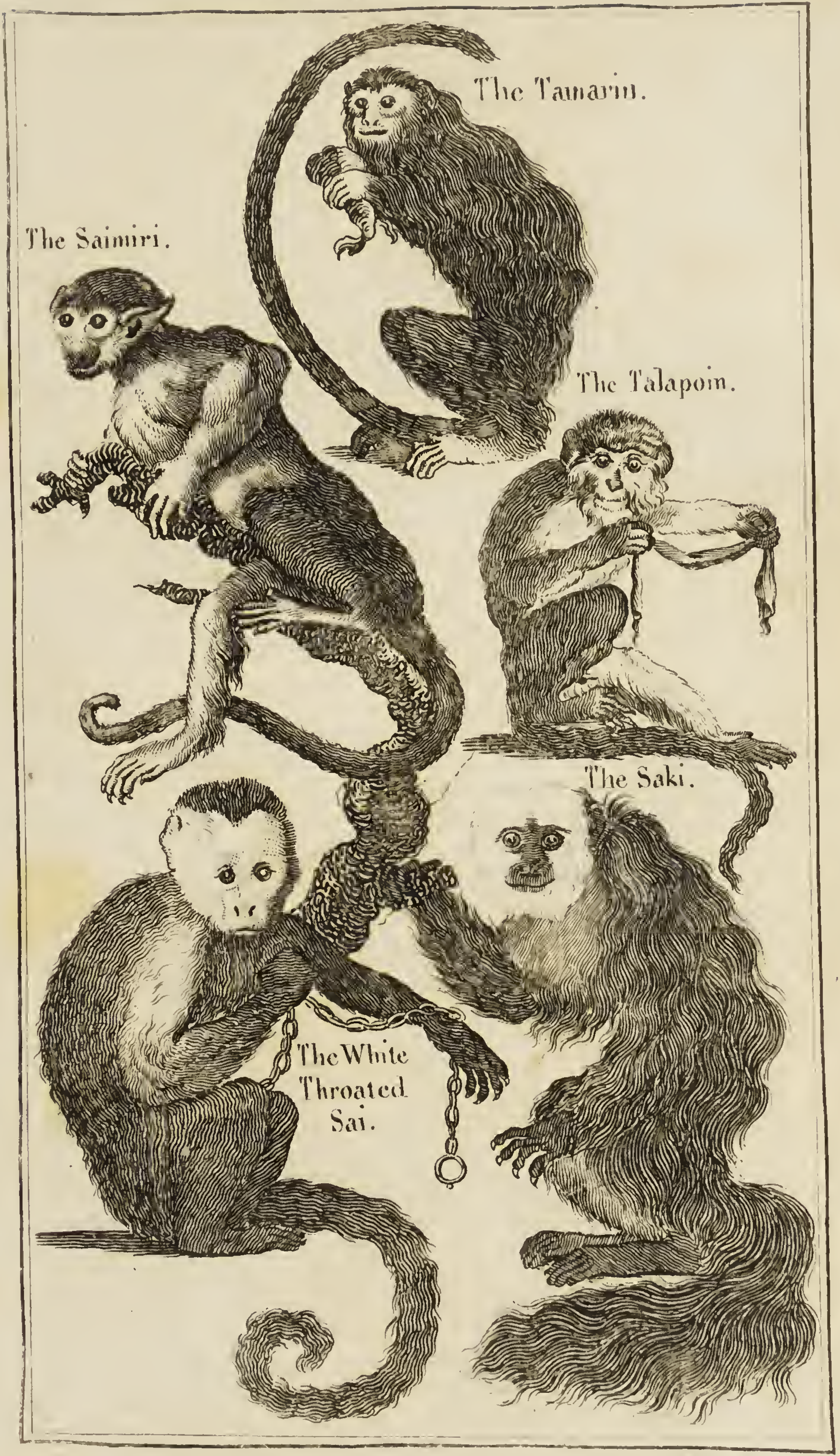
The Tamarin, or Great-eared Monkey.

The Tamarin, or Great-eared Monkey, is much ſmaller than thoſe we have juſt deſcribed (being about ſeven or eight inches long), and differs from them in many characters, particularly in the tail, which is cloathed only with ſhort hair; whereas, that of the ſaki is furniſhed with long hair. The body, head and tail, are covered with dark drown, briſtly hair; and it is remarkable for the largeneſs of its ears, and its yellow feet. It is a lively animal, very eaſily tamed, but ſo exceedingly delicate as not to be able to reſiſt our climate long.

The Wiſtiti, or ſtriated Monkey.

The name of this animal is taken from the ſound of its voice. It is ſmaller than the tamarin, being not above ſix inches long, and its tail more than twice that length, which is annulated black and white, like that of the macacco. Its face is naked, and of a fleſh colour. It has two very ſingular tufts of long white hair on the fore part of the ears, which, although very large, cannot be ſeen by looking at its full face.

MONKEYS. *Plate 21.*


The Tamarin.
The Saimiri.
The Talapoin.
The Saki.
The White Throated Sai.

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Mr Edwards ſays, that, when it thrives well, it has much hair and tufted; that one of thoſe which he ſaw, and which was healthy, fed on biſcuits, fruit, pulſe, inſects, ſnails, &c. He adds that being one day unchained, he ſtruck at a little gold-fiſh which was in a glaſs globe, killed it, and devoured it with the greateſt avidity; that afterwards, ſome ſmall eels being put before him, he was frightened when they twiſted about his neck, but that he ſoon diſpatched them. Theſe animals, when young, have an ugly appearance, having ſcarcely any hair on their bodies. They cling cloſely to the teats of their dam; and as they grow older, they faſten themſelves to her back or ſhoulders. When ſhe is weary of carrying them, ſhe releaſes herſelf by rubbing againſt the wall.

The Marikina.

The Marikina is ſufficiently known by the vulgar name of the Small Lion Monkey. It is about eight inches long, and has a ſmall tuft of hair at the end of the tail: its hair is tufted, long, ſoft, and gloſſy: the head is round: the face is brown: the eyes red: the ears round, naked, and concealed under the long hair which encompaſſes the face. This hair is of a bright red: that on the body and tail, of a very pale yellow, approaching towards white. This animal is of the ſame diſpoſition with other ſagoins, and ſeems to be of a more robuſt temperament. We have ſeen one which lived five or ſix years at Paris, by keeping it, during the winter, in a chamber, wherein a fire was kept every day.

The Pinch.

The Pinch is about nine inches long; and its tail is twice that length. It is remarkable for a kind of white and ſtriped hair on the top and ſides of the head: its face is black, ſhaded by a ſmall grey down: its eyes are black, its tail of a bright red at its inſertion, and even as far as half its length, where it changes to a deep brown. The hair of the upper parts of the body is of a brown colour: that of the breaſt, belly, hands, and feet, is white: the ſkin is black, even where covered with white hair: its throat is naked, and black, like its face; its voice is ſoft, and reſembles more the pipe of a little bird, than the cry of an animal: it is very delicate, and cannot be tranſported from America into Europe, without the greateſt precaution.

The Mico.

We owe the knowledge of this animal to M. de la Condamine, and ſhall therefore give this author's account of it, in his Voyage up the Amazonian River. "The Mico which the Governor of Para made me a preſent of, was the only one of its kind that had been ſeen in the country. The hair of its body was of the moſt beautiful ſilver colour, and its tail of a gloſſy nature, approaching towards a black. It had another more remarkable ſingularity. Its ears, jaws, and ſnout, were tinctured with ſo bright a vermilion, as ſcarcely to be thought natural. I have had it a year; and it was living at the time I was writing this account, almoſt within ſight of the French coaſt, when I hoped to have brought it alive; but, notwithſtanding the continual precautions that I took to preſerve it from the cold, yet the rigour of the ſeaſon probably killed it."

CHAP. XXII.

THE TARTARIAN COW—THE TOTAI.—THE ZISEL.—THE ZEMNI.—THE POUCH.—THE PEROUASCA.—THE SOUSLIK.—THE GOLDEN-COLOURED MOLE.—THE WHITE WATER RAT.—THE GUINEA HOG.—THE WILD BOAR OF CAPE VERD.—THE MEXICAN WOLF.—THE ALCO.—THE TAYRA.—THE PHILANDER OF SURINAM.—THE AKOUCHI.—THE TUCAN—THE BRASILIAN FIELD MOUSE.—THE APEREA.—THE TAPETI.—A VIEW OF THE ANIMALS PECULIAR TO EACH CONTINENT.

The Tartarian Cow.

MR Gmelin, in the new Memoirs of the Royal Academy at Peterſbourg, has given the deſcription of this animal, which ſeems, at firſt ſight, to be a quite different ſpecies from all thoſe we have ſpoken of under the article of buffalo. "This cow," ſays he, "which I ſaw alive, and had painted in Siberia, came from Calmuchia, and was about the length of two Ruſſian ells and an half. The body reſembles that of the common cow; the hair on the body is black, except on the forehead and ſpine of the back, where it is of a white colour. The neck is covered with a mane, and all the reſt of the body with a very long hair, which deſcends to the knees, ſo that the feet appear very ſhort. The back is raiſed in the form of a hunch: the tail reſembles that of a horſe, white, and well clothed with hair: the fore feet are black, and the hinder ones are white: there are two tufts of long hair, one before, and the other behind. The excrements are of a more ſolid nature than thoſe of the common cow; and it grunts like a hog. It is wild, and even ferocious; for, excepting the man who feeds it, it buts all thoſe who approach it: and it diſlikes the company of domeſtic cows."

The Totai.

This animal, which is very common in Baikel Lake, in Tartary, is a little larger than a rabbit, which it reſembles in ſhape, quality, ſmell, and the colour of the hair, and alſo in the habit of burrowing in the earth to conceal itſelf. It differs only in the tail, which is conſiderably longer than that of the rabbit.

The Ziſel.

The ziſel is ſmaller than the hamſter. Its body is long and ſlender, like the weaſel; whilſt on the other hand, that of the hamſter is thick and compact, like that of the rat. It has no external ears, but only auditory paſſages concealed under the hair. The ziſel is of a greyer, or of a more uniform colour, than the hamſter; and the latter is marked in the fore part of its body with three large white ſpots on each ſide. Thoſe differences, added to that of their not mixing together, though natives of the ſame country, are ſufficient to convince us that they are two different ſpecies.

The Zemni.

There is another animal in Poland and Ruſſia, which is called *zeimni*, or *zemni*, of the ſame race with the *ziſel*, but larger, ſtronger, and more miſchievous. It is ſomewhat ſmaller than the domeſtic cat; its head is large, its body ſlender, and its ears are ſhort and round. Theſe have four great inciſive teeth; but the two in the lower jaw are thrice as long as the two in the upper. The feet are very ſhort and hairy, divided into five toes, and armed with crooked claws: the hair is ſoft, ſhort, and of a mouſe colour: the tail is moderately large: its eyes are ſmall and hid, like thoſe of the mole. Its diſpoſition and habitudes are nearly the ſame as thoſe of the hamſter and ziſel: its bite is dangerous: it eats greedily, and plunders orchards and gardens: it burrows; and lives upon grain, fruit and pulſe, which it ſtores in magazines for winter.

The Pouch.

The Pouch is larger than the domeſtic rat: its ſnout is long; and it burrows; and commits depredations in the gardens, &c. There are ſuch numbers near Suraz and Volhinia, that the inhabitants were obliged to abandon the culture of their gardens.

The Perouaſca.

There is alſo in Ruſſia and Poland, eſpecially in Volhinia, an animal which the Ruſſians call *Perewiaſka*, and the Polanders *Pizewiaſka;* a name which we may tranſlate the *cinctured weaſel.* This animal is not ſo large as a pole-cat, covered with a whitiſh hair, tranſverſally ſtriped of a reddiſh colour, which appear as ſo many girdles. It inhabits the woods, and burrows in the earth; its ſkin makes a very beautiful fur.

The Souſlik.

There is found at Caſan, and in the provinces which the Volga pervades, a ſmall animal, called *Souſlik* in the Ruſſian tongue, of which very beautiful furs are made. Its tail is ſhort, like that of the field-mouſe; but what diſtinguiſhes it from the field-mouſe and every other rat, is its coat, which is of a greyiſh hue, with ſmall ſpots of a gloſſy and bright white colour. Theſe little ſpots are exceedingly ſmall, near each other; they are more apparent upon the loins of this animal, than on the ſhoulders and head. "The rats called *Souſliks,*" ſays M. Sanchez, "are taken in great numbers on the ſalt veſſels in the river *Kama*, which falls into the Volga below Caſan. They come down from Salikamſkia, where the ſalt pits are. The Volga, from Simbuſki to Somtoff, is covered with theſe ſalt veſſels. Theſe animals are named *ſouſlik*, i. e. *dainty-mouthed*, becauſe they are very fond of ſalt."

The Golden-coloured Mole.

Not to omit any animals that belong to the North, we ſhall take notice of a kind of mole found in Siberia, called the *Golden-coloured Mole*, the ſpecies of which may be different from the ordinary mole, becauſe the Siberian has no tail. Beſides it has a ſhort ſnout; red and green hair; with only three toes to the fore feet, and four to the hinder; whereas, the common mole has five toes on every foot.

The White Water Rat.

The European water rat is again ſeen in Canada, but its colour is different. Its back is only brown; the reſt of the body is white and brown. The head, the ſnout, and the extremity of the tail are white. The hair ſeems ſofter and more gloſſy than that of our water rat; but they are alike in every other reſpect. Hence we conclude theſe two animals to be of the ſame ſpecies; the whiteneſs of their hair being produced by the coldneſs of the climate.

The Guinea Hog.

The Guinea Hog is nearly of the ſame figure with our hog, and about the ſame ſize as the Siam hog; that is, ſmaller than our boar, or hog. It is a native of Guinea, and has been tranſported into Braſil, where it has multiplied, as in its native country. It is domeſtic and tame: its hair is ſhort, red and gloſſy: it has no briſtles, not even on the back: only the tail, and the crupper near it, are covered with longer hair than the reſt of the body. Its head is not ſo large as that of our hog; and its ears are very long, and turned backwards over its neck: its tail is as much longer, almoſt touching the ground; and it has no hair towards its extremity.

The Wild Boar of Cape Verd.

There is another hog, or wild boar, at Cape Verd, which, by the number of its teeth, and enormous ſize of its two tuſks of the upper jaw, appears to be of a different breed, and perhaps of a different ſpecies, from every other hog, and approaches near the Babirouſſa. Theſe tuſks reſemble ivory horns, rather than teeth. They are half a foot long, and five inches round at the baſe, and are crooked nearly like the horns of a bull.

The Mexican Wolf.

The Mexican Wolf has the ſame figure, the ſame appetites, and the ſame habitudes, as the European or Northern American wolf; and every thing contributes to prove them to be one and the ſame ſpecies. Its head, however, is larger, its neck thicker, and the tail not ſo hairy. Above the mouth, there are ſome thick briſtles, but not ſo rough as thoſe of the hedge-hog; the body is covered with greyiſh hair, marked with ſome white ſpots. The head, which is of the ſame colour as the body, is croſſed with brown ſtripes; and the forehead is adorned with fallow-coloured ſpots. The ears are of a grey colour, like the head and body. There is a long ſpot, of a fallow colour, on the neck; a ſecond ſpot, like the firſt, on the breaſt; and a third on the belly. The flank is marked with cloſe tranſverſal ſtripes, from the back to the belly. The tail is grey, and marked with a fallow ſpot on the middle: and the legs are ſtriped, from top to bottom, of a grey and brown colour. This wolf is the moſt beautiful of the kind; and its fur is highly valued.

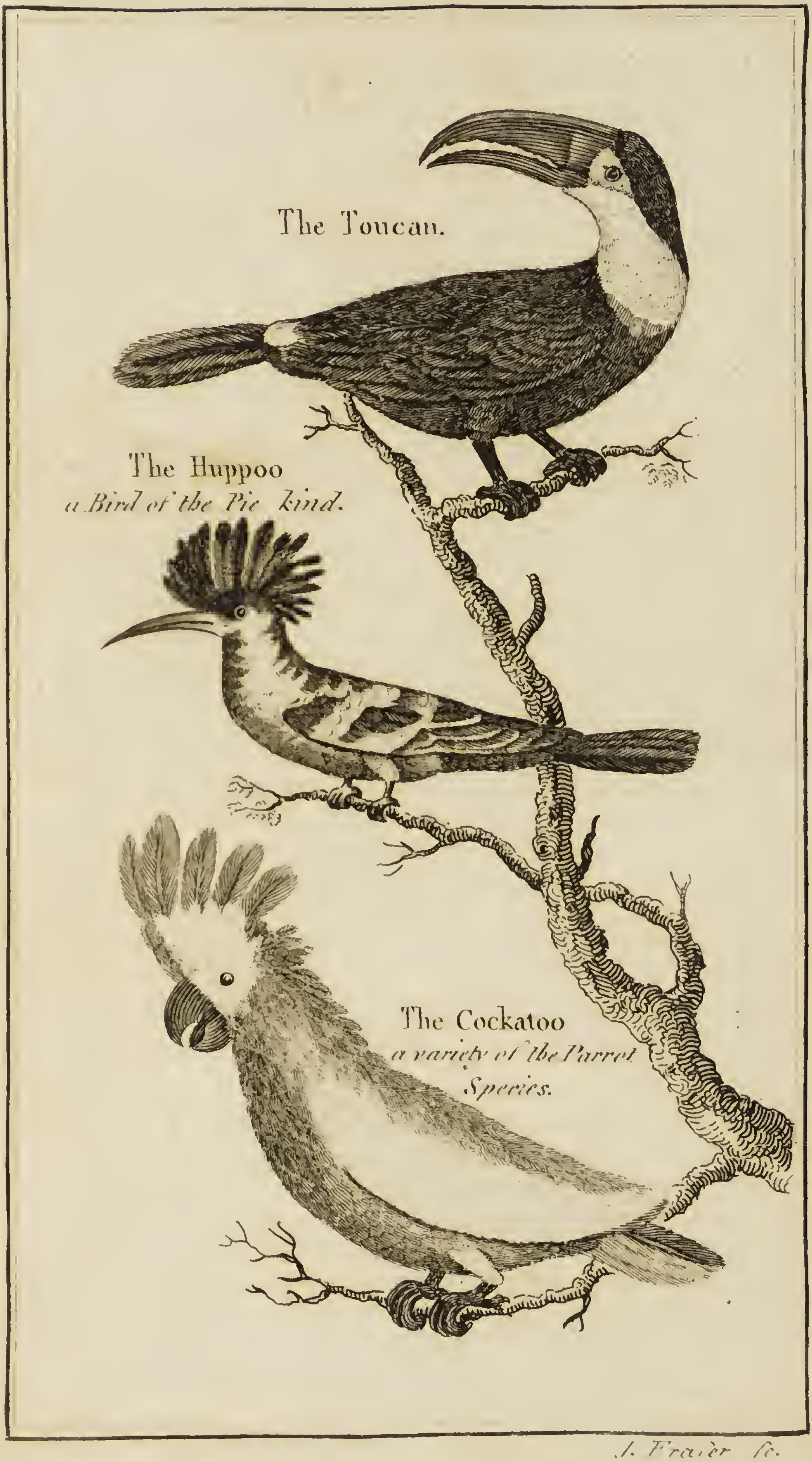
The Alco, or Mexican Dog.

Beſides the dogs, ſays Fernandez, which the Spaniards have tranſported into America, we met with three other ſpecies there, which reſemble our dog, both in nature and manners, and which are not very unlike it in form. The firſt, and the longeſt of theſe American dogs, is that called *Xoloigtcuintli.* What is particularly remarkable in theſe animals, is, their being without hair, and only covered with a ſoft, cloſe ſkin, marked with yellow and blue ſpots. The ſecond is clothed with hair, and, with reſpect to its ſize, ſufficiently reſembles our little Malta dogs. It is marked with white, black and yellow; it is ſingular by its deformity, having a hunched back, and a very ſhort ſnout; ſo that the head ſeems to ſhoot immediately out of the ſhoulders; it is called *Micuacanens,* from the name of its country. The third kind of theſe dogs, called *Techichi,* is ſufficiently like our little dogs; but its look is dull and ſavage. The Americans eat their fleſh. The word *Alco* appears to be a generic term.

The Tayra, or Galera.

The Tayra, or Galera, is about the ſize of a ſmall rabbit, and reſembles the weaſel or the ferret. It burrows like thoſe animals; and its fore feet are very ſtrong, but conſiderably ſhorter than the hinder ones.

Plate 28.



J. Frazer sc.

ones. Its ſnout is elongated, a little pointed, and adorned with a whiſker. Its body is oblong, and greatly reſembles that of a rat: it is covered with brown hair, ſome of which are pretty long, and others much ſhorter. This animal reſembles the ſpecies of ferret, or pole-cat. Linnæus, with ſome reaſon, ſuppoſes, that the black weaſel of Braſil is alſo found in Guiana, where it is called *Tayra.*

The Philander of Surinam.

This animal belongs to the ſame climate, and has an affinity with the ſariga, marmoſe, cayopollin and phalanger. It has very ſparkling eyes, ſurrounded with a circle of deep brown hair. The body is covered with a ſoft hair, or rather a kind of wool, of a reddiſh colour, which is fair on the back, and of a yellowiſh colour on the ſnout, forehead, belly and feet. The feet reſemble the hands of the ape; the fore feet having four fingers and a thumb, with ſhort and obtuſe nails. The thumb or great toe of the hinder feet, however, is flat and obtuſe, the reſt being armed with ſmall, ſharp claws. The young of theſe animals grunt ſomewhat like a pig: they get on the back of their dam, and fix themſelves there, by faſtening their tails to her's. In this ſituation, which is familiar to them, they are carried both ſafely and ſwiftly.

The Akouchi.

The Akouchi is common in Guiana, and other parts of South America. It differs from the agouti by having a tail. The akouchi is generally ſmaller than the agouti; and its hair is not red, but olive.

The Toucan, or Mexican Shrew.

The toucan, or Mexican ſhrew, is a little larger than our mole, and, like it, is fat and fleſhy, with ſo very ſhort legs, that its belly touches the ground. Its tail is ſhort: its ears are ſmall and round: its eyes are ſo very ſmall, that they may be ſaid to be uſeleſs; but it differs from the mole in the colour of its hair, which is reddiſh, and by the number of toes, having only three to the fore, and four to the hind feet. It differs from our mole ſtill farther, by the good quality of its fleſh.

The Field-Mouſe of Braſil.

The field-mouſe of Braſil is conſiderably larger than our mouſe being about five inches from the extremity of the ſnout to the inſertion of the tail, which is only two inches, and conſequently, much ſhorter in proportion than that of the common field-mouſe. Its ſnout is pointed, and its teeth are very ſharp.

The Aperea.

This animal, which is found in Braſil, is neither a rabbit nor a rat; yet it ſeems to participate ſomewhat of the qualities of both. It is about a foot long, by ſeven inches in circumference. The hair is of the ſame colour with that of our hares, but white upon the belly. It has alſo, like that animal, a ſlit lip, large inciſive teeth, and a whiſker about the mouth; but its ears are rounded, like thoſe of a rat. The fore legs are only three inches high; but thoſe behind are longer. The aperea has no tail: its head is a little longer than that of the hare, and its fleſh is like that of a rabbit, which it reſembles in its method of living. It conceals itſelf in holes, but does not burrow like a rabbit, but rather retires into the cavities of the rocks and ſtones. We may add that it is very eaſily taken.

The Tapeti.

I am not far from imagining the tapeti to be a variety of the ſpecies of the rabbit or hare. It is found at Braſil, and other parts of America. It reſembles the European rabbit in figure, and the hare in ſize and colour: its ears are very long, and of the ſame ſhape: its hair is red on the forehead, and whitiſh on the throat. Some have a circle of hair round their neck: they are all white on the throat, breaſt and belly: they have black eyes, and whiſkers like the rabbit, but they have no tail. The tapeti reſembles the hare in its method of living, in its fecundity, and in the quality of its fleſh, which is excellent food. It lives in the fields, or woods, like the hare, and does not burrow in the manner the rabbit does.

Having given ſo full a hiſtory of quadrupeds, very little ſeemed neceſſary to be added for completing the natural hiſtory of that claſs of animals.

The number of diſtinct ſpecies of quadrupeds, according to Buffon and Dr Goldſmith, amounts to about two hundred.—Later authors have enumerated two hundred and eighty.

As the ſubjects of the hiſtory were few, a diſtinct and accurate claſſification appeared unneceſſary; and we have therefore purſued the order of M. De Buffon, who regarded this ſcholaſtic method of treating natural hiſtory, as liable to great objections, and, as more likely to produce confuſion in the mind of the ſtudent, than to aſſiſt his memory.

On one topic only we ſhall enlarge a little.—It has been frequently intimated, that a material difference exiſts between the animals of the Old and the New continent. While America far exceeds us in the ſize of its reptiles, it comes far ſhort of us in its quadruped productions. The truth is, many of the inhabitants of the New continent differ ſo widely from thoſe of the Old, that, though we have generally noted the country of the animal we have deſcribed, yet we conceived, that it might not be unacceptable to the reader, if we endeavoured to exhibit a ſynopſis of the quadrupeds which are peculiar to each continent.—In purſuing this plan, we have made two columns; the one for Europe, Aſia and Africa; the other for America. When we have found an animal of the New continent reſembling nearly that of the Old, we have placed it oppoſite in the ſame line; and we have placed in the middle, thoſe which are common to both.

Europe, Asia and Africa.	America.
Elephant	
Rhinoceros	
Hippopotamus	Tapir
Camel	Lama
Dromedary	Paco
Cameleopard	
Lion	Puma
Tiger	Jaguar
Panther	Couguar
Leopard	Jaguarette
Ounce	Mountain Cat
Zebra	
Horſe	Though not originally found there, horſes and aſſes now abound in America.
Aſs	
Ox	Theſe alſo are now numerous.
Buffalo	
Biſon	
Sheep	Theſe alſo are now produced in America.
Goat	
Hog	Now produced there.
	Peccary
Guinea Hog	Now produced there.
Dog	Now produced there.
	Alco
	Goſchis
Hyæna	
Jackall	
Wolf	
Genet	
Civets	A ſpecies of them is ſaid to have been found there originally.
Cat	Now produced there.
Antelope	
Guinea Stag	
Chamois	
Ibex	
Muſk	
Rabbit	Now produced there.
	Tapeti
Ferret	
Rat	Now produced there.
	Aperea.
Mouſe	Braſilian Field Mouſe
Fat Squirrel	
Garden Squirrel	
Marmot	
Ichneumon	
Badger	
Sable	
Ermine	

Europe, Asia and Africa.		America.
Jerboa		
Maki		
Several ſpecies of Monkeys		Sapajou and Sagoin
		Racoon
		Cabiai
		Tajacou
Pangolin and Phatagin		Ant-Eaters
		Sloth
Rein Deer		Cariacou
		Couandou
		Agouti
		Coati
		Opoſſum
		Pacos
		Indian Hog
		Cavy
		Armadillo
		Ternat Bat
	Stag	
	Bear	
	Roebuck	
	Hare	
	Squirrel	
	Hedge-hog	
	Otter	
	Marmot	
	Shrew Mouſe	Mexican Shrew
	Mole	
	Beaver	
	Wolf	Mexican Wolf
	Fox	
	Weaſel	Tayra
	Ermine	
	Pine Weaſel	
	Pole Cat	
	Lynx	
	Seal	
	Roebuck	
	Elk	
Pouch		
Deſman		Ondatra

Of the 200 ſpecies of quadrupeds which Buffon ſuppoſes to exiſt, he makes about 90 original inhabitants of the Old continent, and about 70 of the New, and thinks that 40 may be accounted common to both.

CHAP.

CHAP. XXIII.

OF BIRDS IN GENERAL.—OF THE OSTRICH—THE EMU—THE CASSOWARY—THE DODO—OF RAPACIOUS BIRDS—THE EAGLE—THE CONDOR—THE VULTURE—THE FALCON AND OTHER HAWKS—THE BUTCHER-BIRD—THE DIFFERENT SPECIES OF OWLS.

ONE obvious mark of diſtinction between this claſs of animals and that of quadrupeds is, that inſtead of hair, birds are covered with feathers, and appear to be nouriſhed in a different manner from the hair of animals. Leſt the feathers ſhould be injured by expoſure to the air, the bird is furniſhed with a gland ſituated on its rump, containing a proper quantity of oil, which it preſſes out with its beak, and with which it occaſionally anoints its feathers. In water fowl this oil is ſo plentiful that it even imparts a degree of rancidity to the fleſh, and we ſee that their coat of feathers is rendered by it completely water-proof.

The wings of birds are remarkably ſtrong. The flap of a ſwan's wing would break a man's leg, and a blow from the wing of an eagle has been known to lay a man dead in an inſtant.

The ſenſe of ſeeing in birds is remarkably acute, and though they have no external ear, but only two ſmall orifices or ear-holes, yet they do not appear to be deficient in hearing. The ſcent of ſome ſpecies is exquiſitely delicate. In decoys where ducks are caught, the men who attend them generally keep a piece of turf lighted, on which they breathe, leaſt the fowl ſhould ſmell them and fly away. The voice of birds is much louder in proportion to their ſize than that of other animals, for in fact, the bellowing of an ox is not louder than the ſcream of a peacock.

The legs, the wings, the bones, and every part of the body, are much lighter, firmer, and more compact in birds than in other creatures. Their lungs are extended all over the cavity of their body.

Carnivorous birds, like carnivorous quadrupeds, have but one ſtomach, but that well calculated for digeſtion. Thoſe that feed on grain have in addition to the crop or ſtomach, where their food is moiſtened and ſwelled, a gizzard, which is a very hard muſcle, almoſt cartilaginous, and which they commonly fill with ſmall ſtones, where the food is afterwards ground, that it may be completely digeſted. Birds are ſubject to few diſeaſes.

Birds of the ſame ſpecies do not always make their neſts of the ſame materials, though in general there is a uniformity. The red-breaſt in ſome parts of England makes its neſt with oak leaves where thoſe leaves are plenty, in other parts it makes it with moſs and hair. Where the eggs are numerous it is neceſſary to make the neſt warm. Hence the wren, which is a ſmall animal, and able to cover but a ſmall compaſs, and yet lays many eggs, makes her neſt remarkably warm. On the contrary the plover, the eagle, the crow, &c. which lay but two or three, are not equally ſolicitous in this reſpect.

There are ſome birds which are called birds of paſſage, and which by migrating make an habitation in all parts of the earth; but in general every climate has birds peculiar to itſelf. In all countries birds are much longer lived than quadrupeds. The ſwan is ſaid to live near three hundred years. They are however greatly inferior to quadrupeds in ſenſe and docility.

As the number of ſpecies in this order of animals is very numerous, amounting to above eight hundred, ſome degree of claſſification appears to be abſolutely neceſſary. We ſhall therefore adopt the ſix claſſes of Linnæus, without purſuing his order in too ſervile a manner; and ſhall deſcribe at leaſt the principal birds in each claſs. After a ſhort account of the oſtrich, the emu, the caſſowary and the dodo, we ſhall proceed to the birds of the rapacious claſs.

The Oſtrich.

The Oſtrich is the largeſt of all birds. The head and bill ſomewhat reſemble thoſe of a duck; and the neck may be likened to that of a ſwan, but that it is much longer. The legs and thighs reſemble thoſe of an hen; though the whole appearance at a diſtance bears a ſtrong reſemblance to that of a camel, it is generally ſeven feet high from the top of the head to the ground; but from the back it is only four. Hence the head and neck are not above three feet long. From the top of the head to the rump, when the neck is ſtretched out in a right line, it is ſix feet long, and the tail is about a foot more. One of the wings, without the feathers, is a foot and an half; and being ſtretched out, with the feathers, is three feet.

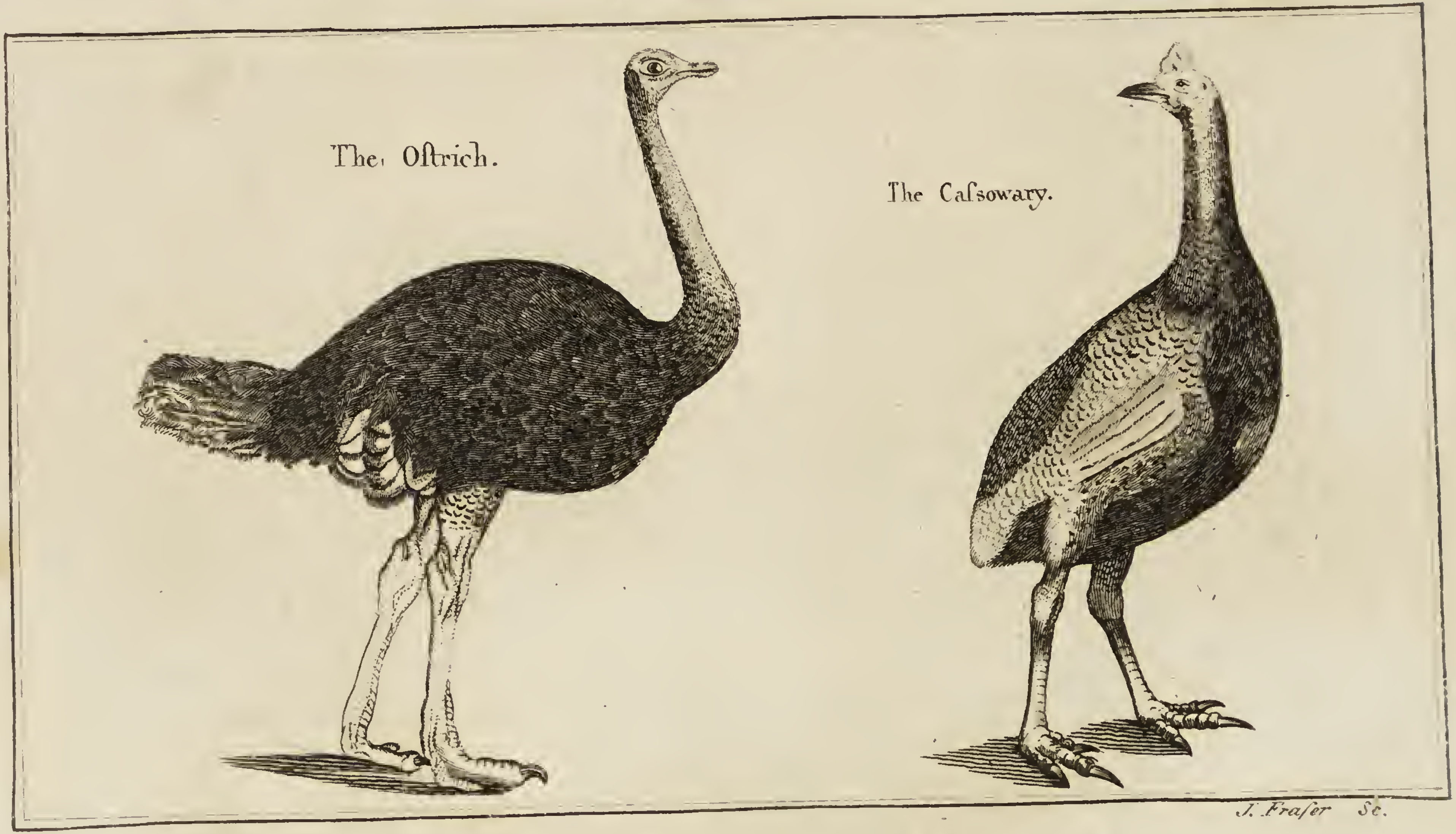
The plumage is, generally black and white in all; though ſome of them are ſaid to be grey. The greateſt feathers are at the extremities of the wings and tail, and the largeſt are generally white. The next row is black and white; and of the ſmall feathers, on the back and belly, ſome are white and others black. There are no feathers on the ſides, nor on the thighs, nor under the wings. The lower part of the neck, about half way, is covered with ſtill ſmaller feathers than thoſe on the belly and back; and thoſe, like the former, alſo are of different colours. The head and upper part of the neck are covered with hair.

At the end of each wing, there is a kind of ſpur almoſt like the quill of a porcupine. It is an inch long, being hollow and of an horny ſubſtance. There are two of theſe on each wing; the largeſt of which is at the extremity of the bone of the wing, and the other a foot lower. The neck ſeems to be more ſlender in proportion to that of other birds, from the want of feathers.

The thighs are very fleſhy and large, being covered with a white ſkin, inclining to redneſs, and wrinkled in the manner of a net, whoſe meſhes will admit the end of a finger. Some have very ſmall feathers here and there on the thighs; and others again have neither feathers nor wrinkles. The legs are covered before with large ſcales. The end of the foot is cloven, and has two very large toes, which, like the leg, are covered with ſcales. Theſe toes are of unequal ſizes. The largeſt, which is on the inſide, is ſeven inches long, including the claw, which is near three-fourths of an inch long, and almoſt as broad. The other toe is but four inches long, and has no claws.

The oſtrich is a native only of the torrid regions of Africa. Its fleſh is proſcribed in Scripture; and moſt of the ancient writers deſcribe it as well known in their times. Like the race of the elephant it is tranſmitted down without mixture; and has never been known to breed out of that country which firſt produced it. It

Plate 23.


The, Oſtrich.
The Caſsowary.

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prefers the moſt ſolitary and horrid deſarts, for its habitation where there are few vegetables to clothe the ſurface of the earth, and where a drop of rain never refreſhes it. The Arabians aſſert that the oſtrich never drinks; and the place of its habitation ſeems to confirm the aſſertion. In theſe formidable regions, oſtriches are ſeen in large flocks, which to the diſtant ſpectator appear like a regiment of cavalry, and have often alarmed a whole caravan. There is no deſart, how barren ſoever, but is capable of ſupplying theſe animals with proviſion. They eat almoſt every thing; and theſe barren tracts are thus doubly grateful, as they afford both food and ſecurity. The oſtrich is of all animals the moſt voracious. It will devour leather, graſs, hair, iron, ſtones, or whatever is given to it. Nor are its powers of digeſtion leſs in what is digeſtible. Thoſe ſubſtances which the coats of the ſtomach cannot ſoften, paſs whole. Hence glaſs, ſtones, or iron, are excluded in the form in which they were devoured. All metals, indeed, which are ſwallowed by any animal, loſe a part of their weight, and often the extremities of their figure, from the action of the juices of the ſtomach upon their ſurface. A quarter piſtole, which was ſwallowed by a duck, loſt ſeven grains of its weight in the gizzard before it was voided; and it is probable that a ſtill greater diminution of weight would happen in the ſtomach of an oſtrich. Conſidered in this light, therefore, this animal may be ſaid to digeſt iron; but ſuch ſubſtances ſeldom remain long enough in the ſtomach of any animal to undergo ſo tedious an operation. The oſtrich lays very large eggs; ſome of them being above five inches in diameter, and weighing above fifteen pounds. Theſe eggs have a very hard ſhell, ſomewhat like thoſe of the crocodile, except that thoſe of the latter are leſs and rounder.

The ſeaſon for laying in the northern parts of Africa is about the beginning of July; in the ſouth, it is about the latter end of December. Theſe birds are very prolific, and lay generally from forty to fifty eggs at one clutch. It has been commonly reported that the female depoſits them in the ſand; and, covering them up, leaves them to be hatched by the heat of the climate, and then permits the young to ſhift for themſelves. Very little of this however is true: no bird has a ſtronger affection for her young than the oſtrich, and none watches her eggs with greater care. It happens, indeed, in thoſe hot climates, that there is leſs neceſſity for the continual incubation of the female; and ſhe more frequently leaves her eggs, which are in no fear of being chilled by the weather. But though ſhe ſometimes forſakes them by day, ſhe always carefully broods over them by night; nor is it more true that they forſake their young after they are ſet free from the ſhell. On the contrary, the young are not even able to walk for ſeveral days after they are hatched. During this time; the old ones are very aſſiduous in ſupplying them with graſs, and very careful to defend them from danger. They even encounter every danger in their defence.

Beſides the value of their plumage, ſome of the ſavage nations of Africa, hunt them alſo for their fleſh; which they conſider as a dainty. They ſometimes alſo breed theſe birds tame in order to eat the young, of which the female is ſaid to be the greateſt delicacy; and a ſingle egg is ſaid to be a ſufficient entertainment for eight men.

As the ſpoils of the oſtrich are thus valuable, it is not to be wondered at that man has become their moſt aſſiduous purſuer. For this purpoſe,

poſe, the Arabians train up their beſt and fleeteſt horſes, and hunt the oſtrich. Perhaps, of all varieties of the chaſe, this, though the moſt laborious, is yet the moſt entertaining. As ſoon as the huntſman comes within ſight of his prey he puts on his horſe with a gentle gallop, ſo as to keep the oſtrich ſtill in ſight. At the ſame time however, he takes care not to terrify it from the plain into the mountains. Of all known animals that make uſe of their legs in running, the oſtrich is by far the ſwifteſt. Upon obſerving himſelf therefore purſued at a diſtance, he begins to run at firſt, but gently; either inſenſible to his danger, or ſure of eſcaping. In this ſituation he ſomewhat reſembles a man at full ſpeed. His wings, like two arms, keep working with a motion correſpondent to that of his legs; and his ſpeed would very ſoon ſnatch him from the view of his purſuers. Unfortunately, however, for the ſilly creature, inſtead of going off in a direct line, it takes its courſe in circles; while the huntſmen ſtill make a ſmall courſe within, relieve each other, meet it at unexpected turns, and purſue it in this manner for two or three days together. At laſt, quite exhauſted, and finding all power to eſcape impoſſible, it endeavours to hide itſelf from thoſe enemies it cannot avoid, and covers its head in the ſand, or the firſt thicket it meets. Sometimes, however, it attempts to face its purſuers: and, though in general the moſt gentle animal in nature, when driven to deſperation it defends itſelf with its beak, its wings and its feet.

The Emu.

Of the Emu, which many call the American oſtrich, but little is known. It is an inhabitant of the New Continent; and the travellers who have mentioned it, ſeem to have been more ſolicitous of proving its affinity to the oſtrich, than of deſcribing thoſe peculiarities which diſtinguiſh it from the reſt of the feathered creation.

It is chiefly found in Guiana, along the banks of the Oroonoko, in the inland provinces of Braſil and Chili, and the vaſt foreſts that border on the mouth of the river Plata. They are known to have been in many other parts of South America; but as its inhabitants increaſed, theſe large and timorous birds either fell beneath their ſuperior power, or fled from their vicinity.

The emu, though not ſo large as the oſtrich, is only ſecond to it in magnitude. It is by far the largeſt bird in the New Continent; and is generally found to be ſix feet high, meaſuring from its head to the ground. Its legs are three feet long; and its thigh is near as thick as that of a man. It is covered from the back and rump with long feathers, which are grey upon the back, and white on the belly. It goes very ſwiftly, and ſeems aſſiſted in its motion by a kind of tubercle behind, like an heel, upon which, on plain ground, it treads very ſecurely. In its courſe it uſes a very odd kind of action, lifting up one wing, which it keeps elevated for a time; till letting it drop, it lifts up the other. It runs ſo ſwiftly, that the fleeteſt dogs are thrown out in the purſuit. One of them, finding itſelf ſurrounded by the huntſmen, darted among the dogs with ſuch fury that they made way to avoid its rage; and it eſcaped, by its amazing velocity, in ſafety to the mountains.

When the young ones are firſt hatched, they are familiar, and follow the firſt they meet. I have been followed myſelf, ſays Wafer, by many of theſe young oſtriches; which, at firſt, are extremely harmleſs and ſimple: but as they grow older, they become more cunning and diſtruſtful; and run ſo faſt, that a greyhound can ſcarcely outſtrip them. Their fleſh, in general, is palatable; eſpecially if they be young. It would be no difficult matter to rear up flocks of theſe animals tame, particularly as they are naturally ſo familiar. They might alſo be found to anſwer domeſtic purpoſes, like the hen, or the turkey. Their food could not be expenſive, if, as Narborough ſays, they live entirely upon graſs.

The Caſſowary.

The Caſſowary is a bird which was firſt brought into Europe by the Dutch, from Java, in the Eaſt-Indies, where it is only to be found.

The caſſowary, though not ſo large as the former, yet appears more bulky to the eye; its body being nearly equal, and its neck and legs much thicker and ſtronger in proportion. This conformation gives it an air of ſtrength and force, which the fierceneſs and ſingularity of its countenance conſpire to render formidable. It is five feet and an half long, from the point of the bill to the extremity of the claws. The legs are two feet and an half high, from the belly to the end of the claws. The wing is ſo ſmall, that it does not appear; being hid under the feathers of the back. In other birds, a part of the feathers ſerve for flight, and are different from thoſe that ſerve for mere covering; but in the caſſowary, all the feathers are of the ſame kind. They are generally double; having two long ſhafts, growing out of a ſhort one, which is fixed in the ſkin. The beards that adorn the ſtem or ſhaft, are from about half way to the end, very long, and as thick as an horſe-hair, without being ſubdivided into fibres. The ſtem or ſhaft is flat, ſhining, black, and knotted below; and from each knot there proceeds a beard. The beards too at the end of the large feathers are perfectly black; and towards the root they are of a grey tawny colour; ſhorter, ſofter and throwing out fine fibres, like down. Nothing therefore appears except the ends, which are hard and black; becauſe the other part, compoſed of down, is quite covered. There are feathers on the head and neck; but they are ſo ſhort, and thinly ſown, that the bird's ſkin appears naked, except towards the hinder part of the head, where they are a little longer. The wings, when they are deprived of their feathers, are but three inches long. The ends of the wings are adorned with five prickles, which differ both in reſpect of length and thickneſs, and which bend like a bow: theſe are hollow from the roots to the very points having only that ſlight ſubſtance within, which all quills are known to have. The longeſt of theſe prickles is eleven inches; and it is a quarter of an inch in diameter at the root, being thicker there than towards the extremity: the point ſeems to be broken off.

The part, however, which diſtinguiſhes this animal moſt is the head and which though ſmall, like that of an oſtrich, does not fail to inſpire ſome degree of terror. It is without feathers, and in a manner armed with a helmet of horny ſubſtance, that covers it from the root of the bill to near half the head backwards. This helmet is black before and yellow behind. Its ſubſtance is very hard, being formed by the elevation of the bone of the ſkull; and it conſiſts of ſeveral plates, one above another, like the horn of an ox. Some have ſuppoſed that this was ſhed every year with the feathers; but the moſt probable opinion is, that it only exfoliates ſlowly like the beak. To the peculiar oddity of this natural armour may be added the colour of the eye in this animal, which is a bright yellow, and the globe being above an inch and an half in diameter, give it an air equally fierce and extraordinary. At the bottom of the upper eye-lid, there is a row of ſmall hairs, over which there is another row of black hair, which are pretty like an eye-brow. The ſides of the head, about the eye and ear, being deſtitute of any covering, are blue, except the middle of the lower eye-lid, which is white. The neck is of a violet colour, inclining to that of ſlate; and it is red behind in ſeveral places, but chiefly in the middle. About the middle of the neck before, at the riſe of the large feathers, there are two projections formed by the ſkin, which are ſomewhat like the gills of a cock, with this difference, however, that they are blue as well as red. The ſkin which covers the fore part of the breaſt, on which this bird leans and reſts, is hard, callous, and without feathers. The thighs and legs are covered with feathers, and are extremely thick, ſtrong, and ſtraight; but the legs are thicker a little above the foot than in any other place. The toes are covered with ſcales, and are but three in number; for that which ſhould be behind is wanting.

Thus formed for a life of hoſtility, one might naturally ſuppoſe that the caſſowary was one of the moſt terrible of animals. But nothing is ſo oppoſite to its natural character, nothing ſo different from the life it is contented to lead. It never attacks others; and inſtead of the bill, when attacked, it rather makes uſe of its legs, and kicks like an horſe, or runs againſt its purſuer, beats him down, and treads him to the ground.

The manner of going of this animal is not leſs extraordinary than its appearance. Inſtead of proceeding directly forward, it ſeems to kick up behind with one leg, and then making a bound onward with the other it advances with ſuch prodigious velocity, that the ſwifteſt racer would be left far behind.

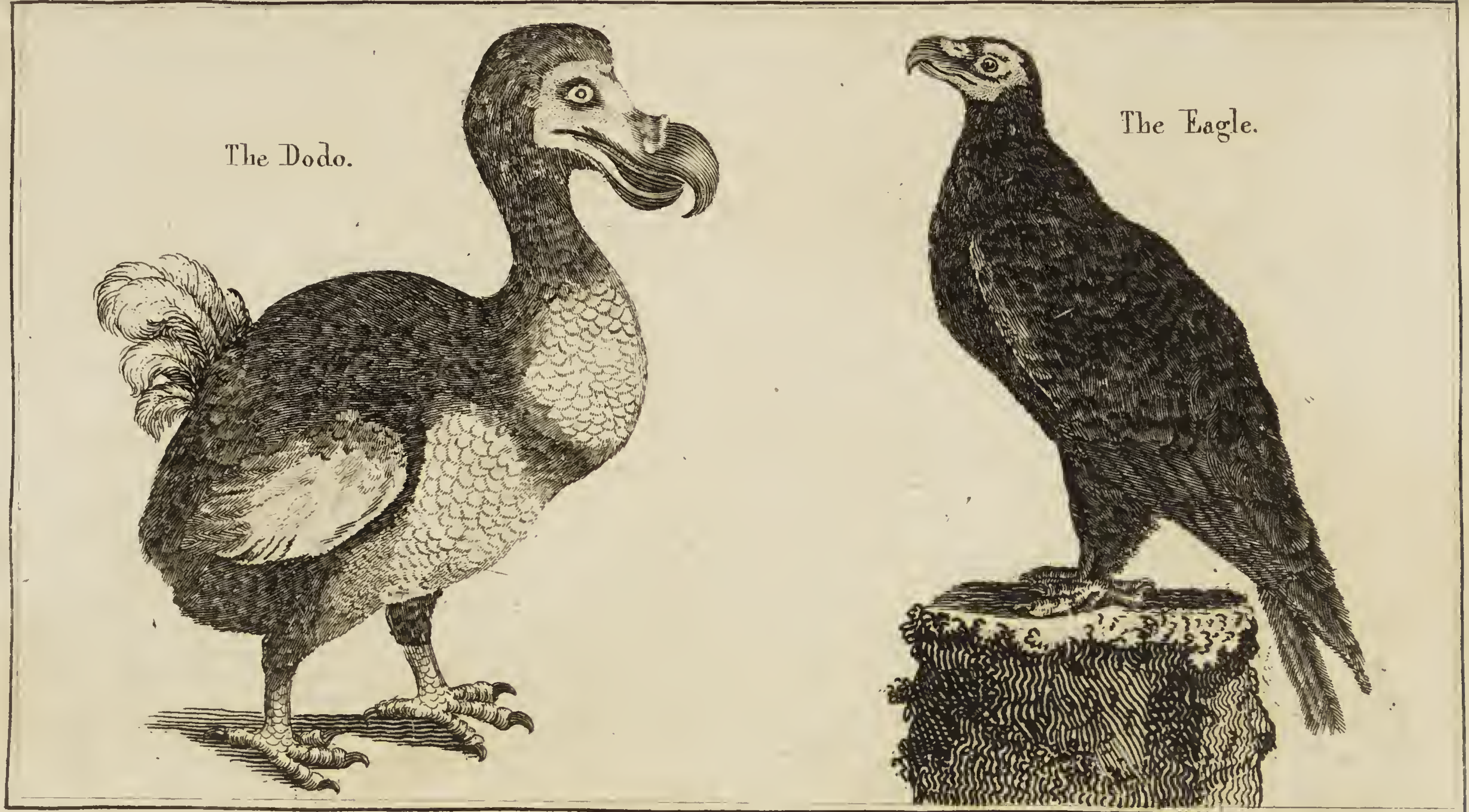
The ſame degree of voraciouſneſs which we perceived in the oſtrich, obtains as ſtrongly here. The caſſowary ſwallows every thing that comes within the capacity of its gullet. The Dutch aſſert that it can devour not only glaſs, iron, and ſtones, but even burning coals, without the leaſt hurt. It is ſaid that the paſſage of the food through its gullet is performed ſo ſpeedily, that even the very eggs which it has ſwallowed whole, paſs through it unbroken, in the ſame form they went down. The caſſowary's eggs are of a grey aſh colour, inclining to green. The largeſt is found to be fifteen inches round one way, and about twelve the other.

The ſouthern parts of the moſt eaſtern Indies ſeems to be the natural climate of the caſſowary. His domain, if we may ſo call it, begins where that of the oſtrich terminates. The latter has never been found beyond the Ganges; while the caſſowary is never ſeen nearer than the iſlands of Banda, Sumatra, Java, the Molucca Iſlands, and the correſponding parts of the continent.

The Dodo.

The Dodo inſtead of appearing to be ſwift, ſeems to be moſt unwieldy and inactive. Its body is maſſive, almoſt round, and covered with grey feathers: it is juſt barely ſupported upon two ſhort thick legs like pillars. The neck, thick and purſy, is joined to the head, which conſiſts

Plate 24.


The Dodo.
The Eagle.

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ſiſts of two great chaps, that open far behind the eyes, which are large black and prominent. Hence the animal when it gapes ſeems to be all mouth. The bill therefore is of an extraordinary length, not flat and broad, but thick, and of a bluiſh white, ſharp at the end, and each chap crooked in oppoſite directions. From all this reſults a ſtupid and voracious phyſiognomy; which is ſtill more encreaſed by a border of feathers like an hood round the root of the beak. The dodo is furniſhed with wings, covered with ſoft aſh coloured feathers, but they are too ſhort to aſſiſt it in flying. Its tail conſiſts of a few ſmall curled feathers, but it is diſproportioned and diſplaced. Its legs are too ſhort for running, and its body too fat to be ſtrong.

This bird is a native of the Iſle of France; and the Dutch, who firſt diſcovered it there, called it in their language the *nauſeous bird*, as well from its diſguſting figure, as from the bad taſte of its fleſh. However, ſucceeding obſervers contradict this firſt report, and aſſert that its fleſh is good and wholeſome. It is a ſimple bird, and is very eaſily taken. Three or four dodos are enough to dine an hundred men.

The Golden Eagle.

The golden eagle is the largeſt and the nobleſt of all thoſe birds that have received the name of eagle. It weighs about twelve pounds. It is three feet long; the extent of its wings are ſeven feet four inches; the bill is three inches long, and of a deep blue; and the eye is of an hazel colour. The ſight and ſenſe of ſmelling are very acute. The head and neck are clothed with narrow, ſharp pointed feathers, of a deep brown colour, bordered with tawny; but thoſe on the crown of the head, in very old birds, turn grey. The whole body, above as well as below, is of a dark brown; and the feathers of the back are finely clouded with a deeper ſhade of the ſame. The wings when clothed reach to the end of the tail. The quill feathers are of a chocolate colour, and the ſhafts are white. The tail is of a deep brown, irregularly barred and blotched with an obſcure aſh-colour, generally white at the roots of the feathers. The legs are yellow, ſhort, and very ſtrong, being three inches in circumference, and feathered to the very feet. The toes are covered with large ſcales, and armed with the moſt formidable claws, the middle of which are two inches long.

In the rear of this terrible bird follow the *ring-tailed eagle*, the *common eagle*, the *bald eagle*, the *white eagle*, the *kough-footed eagle*, the *erne*, the *black eagle*, the *oſprey*, the *ſea-eagle*, and the *crowned eagle*. Theſe, and others that might be added, form different ſhades in this fierce family; but have all the ſame rapacity, the ſame general form, the ſame habits, and the ſame manner of rearing their young.

In general, theſe birds are found in mountainous countries, and breed among the loftieſt cliffs. They chuſe thoſe places which are remoteſt from man, upon whoſe poſſeſſions they but ſeldom make their depredations, being contented rather to purſue the wild game in the foreſt, than to riſque their ſafety to ſatisfy their hunger.

It requires great patience and much art to tame an eagle; and even though taken young, and rendered ſubmiſſive by long aſſiduity, yet ſtill it is a dangerous domeſtic, and often directs its violence againſt its maſter. When brought into the field for the purpoſes of fowling, the falconer is never ſure of its attachment. That innate pride, and love of liberty, ſtill prompt it to regain its native ſolitudes; and the moment the ſalconer ſees it, when let looſe, firſt ſtoop towards the ground, and then riſe perpendicularly into the clouds, he gives up all his former labour for loſt. Sometimes, however, they are brought to have an attachment for their feeder: they are then highly ſerviceable, and liberally provide for his pleaſures and ſupport. When the falconer lets them go from his hand, they play about and hover round him till their game preſent itſelf, which they diſcover at an immenſe diſtance, and always purſue with ſucceſs.

Of all animals the eagle flies higheſt. Of all birds alſo, he has the quickeſt eye; but his ſenſe of ſmelling is far inferior to that of the vulture. He never purſues, therefore, but in ſight; and when he has ſeized his prey, he ſtoops from his height, as if to examine its weight, always laying it on the ground before he carries it off. Although his wing is very powerful, yet, as he has but little ſuppleneſs in the joints of the leg, he finds it difficult to riſe when down; however, if not inſtantly purſued, he finds no difficulty in carrying off geeſe and cranes. He alſo ſnatches off hares, lambs, and kids; and often deſtroys fawns and calves. Infants themſelves, when left unattended, have been deſtroyed by theſe rapacious creatures; which probably gave riſe to the fable of Ganymede's being ſnatched up by an eagle to heaven.

An inſtance is recorded of two children being carried off by eagles in Scotland; but fortunately they ſuffered no hurt by the way. The eagles too being purſued, the children were reſtored ſafe out of the neſts to the affrighted parents.

The eagle is always a formidable neighbour; but particularly when rearing its young. It is then that the female, as well as the male, exert all their force and induſtry in behalf of their young. Smith, in his Hiſtory of Kerry, relates, that a poor man in that country got a comfortable ſubſiſtence for his family, during a ſummer of famine, out of an eagle's neſt, by robbing the eaglets of food, which was plentifully ſupplied by the old ones. He protracted their aſſiduity beyond the uſual time, by clipping the wings, and retarding the flight of the young.

It happened ſome time ago, in the ſame country, that a peaſant reſolved to rob the neſt of an eagle, that had built in a ſmall iſland, in the beautiful lake of Killarney. He accordingly ſtripped, and ſwam in to the iſland, while the old ones were abſent; and, having robbed the neſt of its young, he was preparing to ſwim back, with the eaglets tied in a ſtring. Whilſt, however, he was up to the chin in the water, the old eagles returned, and, miſſing their young, quickly fell upon the plunderer, and, in ſpite of all his reſiſtance, diſpatched him with their beaks and talons.

In order to extirpate theſe pernicious birds, there is a law in the Orkney Iſlands, which entitles any perſon that kills an eagle to a hen out of every houſe in the pariſh in which the plunderer is killed.

The neſt of the eagle is uſually built in the moſt inacceſſible cliff of the rock, and often ſhielded from the weather by ſome jutting crag that hangs over it. Sometimes, however, it is wholly expoſed to the winds: for the neſt is flat, though built with great labour. It is ſaid that the ſame neſt ſerves the eagle during life; and indeed the pains beſtowed in forming it ſeems to argue as much. It is aſſerted, that as ſoon as the young ones are ſomewhat grown, the dam kills the moſt feeble or the moſt voracious. If this happen, it muſt proceed only from the neceſſities of the parent, who is incapable of providing for their ſupport; and is content to ſacrifice a part to the welfare of the majority.

The plumage of the eaglets is not ſo ſtrongly marked as when they come to be adult. They are at firſt white; then inclining to yellow; and at laſt of light brown. Age, hunger, long captivity, and diſeaſes, make them whiter. They are ſaid to live above an hundred years: and they at laſt die, not of old age, but from the beak turning inward upon the under mandible, and thus preventing their taking any food. They are indeed equally remarkable, for their longevity, and for their power of continuing a long time from food. One of this ſpecies, which has now been nine years in the poſſeſſion of Mr Owen Holland, of Conway, lived thirty-two years with the gentleman who made him a preſent of it; but what its age was when the latter received it from Ireland, is unknown. The ſame bird alſo affords a proof of the truth of the other remark; having once, through the neglect of ſervants, endured hunger for twenty-one days.

Such are the general characteriſtics and habitudes of the eagle; however, in ſome theſe habitudes differ, as the ſea eagle and the oſprey live chiefly upon fiſh, and conſequently build their neſts on the ſea-ſhore. They alſo build by the ſides of rivers, on the ground among reeds; and often lay three or four eggs, rather leſs than thoſe of a hen, of a white elliptical form. They catch their prey, which is chiefly fiſh, by darting down upon them. The Italians compare the violent deſcent of theſe birds on their prey, to the fall of lead into the water; and call them aquila plumbina, or the leaden eagle.

Nor is the bald eagle, which is an inhabitant of North Carolina, leſs remarkable for habits peculiar to itſelf. It flies very heavily; and cannot overtake its prey, like others of the ſame denomination. To remedy this, it often attends a ſort of fiſhing hawk, which it purſues, and ſtrips the plunderer of its prey. This is the more remarkable, as this hawk flies ſwifter than it. It alſo generally attends upon fowlers in the winter; and when any birds are wounded, they are certain of being ſeized by the eagle, though they may fly from the fowler. This bird will often alſo ſteal young pigs, and carry them alive to the neſt, which is compoſed of twigs, ſticks, and rubbiſh. This neſt is large enough to fill the body of a cart; and is commonly full of bones, and putrid fleſh, the ſtench of which is intolerable.

The diſtinctive marks of each ſpecies are as follow.

The *golden eagle*, is of a tawny, iron colour: its head and neck are of a reddiſh iron: the tail feathers are of a dirty white, marked with croſs bands of tawny iron: the legs are covered with tawny iron feathers.

The *common eagle*, is of a brown colour: the head and upper part of the neck inclines to red; the tail feathers are white, blackening at the ends: the outer ones, on each ſide, are of an aſh colour, the legs are covered with feathers of a reddiſh brown.

The *bald eagle*, is brown: the head, neck and tail feathers are white; the feathers of the upper part of the leg are brown.

The *white eagle*, is perfectly white.

The *rough-footed eagle*, is of a dirty brown colour: ſpotted under the wings, and on the legs, with white: the feathers of the tail are white at the beginning and the point; the leg feathers are dirty brown, ſpotted with white.

The *white tailed eagle*, is a dirty brown: its head is white; the ſtems of the feathers are black; the rump inclines to black; the tail-feathers, the firſt half black, the end half white: its legs are naked.

The *erne*, is of a dirty iron colour above, of an iron mixed with black below: the head and neck are aſh, mixed with cheſnut: the points of the wings are blackiſh, the tail feathers are white; the legs are naked.

The *black eagle*, is blackiſh: the head and upper part of the neck mixed with red; the tail-feathers, are the firſt half white, ſpeckled with black; the other half, blackiſh; the leg-feathers are of a dirty white.

The *ſea eagle*, inclines to white, mixed with iron brown; its belly is white, with iron-coloured ſpots; the covert feathers of the tail are whitiſh; the tail-feathers are black at the extremity: the upper part of the leg-feathers are of an iron brown.

The *oſprey*, is brown above; and white below; the back of the head is white; the outward tail-feathers, on the inner ſide, are ſtreaked with white; and its legs are naked.

The *jean le blanc*, is browniſh grey above; but white ſpotted with tawny brown, below; the tail feathers on the outſide, and at the extremity, are brown: on the inſide, they are white, ſtreaked with brown: the legs are naked.

The *eagle of Braſil*, is a blackiſh brown; its wings are mixed with aſh colour: its tail feathers are white, and its legs are naked.

The *Oroonoko eagle*, with a topping, above, is blackiſh brown: below, it is white, ſpotted with black: the upper part of the neck is yellow: the tail-feathers are brown, with white circles; its leg-feathers are white, ſpotted with black.

The *crowned African eagle*, with a topping: its tail is of an aſh-colour, ſtreaked on the upper ſide with black.

The *eagle of Pondicherry*, is of a cheſnut colour, the half of the ſix outward tail feathers are black.

The Condor.

The Condor poſſeſſes, in an higher degree than the eagle, all the qualities that render it formidable, not only to the feathered kind, but to beaſts, and even to man himſelf. It is eighteen feet acroſs, when its wings are extended. The beak is ſo ſtrong as to pierce the body of a cow; and two of them are able to devour it. They do not even abſtain from man himſelf: but fortunately there are but few of the ſpecies. The Indians aſſert, that they will carry off a deer, or a young calf, in their talons, as eagles would an hare or a rabbit. They ſeldom frequent the foreſts, as they require a large ſpace for the diſplay of their wings; but they are found on the ſea-ſhore, and the banks of rivers, whither they deſcend, at certain ſeaſons, from their heights of the mountains. Condamine has frequently ſeen them in ſeveral parts of the mountains of Quito, and obſerved them hovering over a flock of ſheep; and he thinks they would, once, have attempted to carry one off, had they not been ſcared away by the ſhepherds. The condor is of a brown colour.

It is doubted whether this animal be peculiar to America only, or whether it may not have been deſcribed by the naturaliſts of other countries.

tries. It is ſuppoſed, that the great bird, called the Rock, deſcribed by Arabian writers, and ſo much exaggerated by fable, is but a ſpecies of the condor. The great bird of Tarnaſſar, in the Eaſt Indies, which is larger than the eagle, as well as the vulture of Senegal, which carries of children, are nothing elſe but the condor. Ruſſia, Lapland, and even Switzerland and Germany, are ſaid to have been acquainted with this animal. In the deſarts of Pachomac, where it is chiefly ſeen, men ſeldom venture to travel. Thoſe wild regions are ſufficient of themſelves to inſpire a ſecret horror: broken precipices—prowling panthers—foreſts only vocal with the hiſſing of ſerpents—and mountains rendered ſtill more terrible by the condor, the only bird that ventures to make its reſidence in thoſe dreary ſituations.

The Vulture.

Vultures may be eaſily diſtinguiſhed from all thoſe of the eagle kind, by the nakedneſs of their heads and necks, which are without feathers, and only covered with a very ſlight down, or a few ſcattered hairs. Their eyes are more prominent; thoſe of the eagle being buried more in the ſocket. The claws are ſhorter, and leſs hooked. The inſide of the wing is covered with a thick down, which is different in them from all other birds of prey. Their attitude is not ſo erect as that of the eagle; and their flight more difficult and heavy.

In this tribe we may claſs the golden, the aſh-coloured, and the brown vulture, which are inhabitants of Europe; the ſpotted, and the black vulture of Egypt; the bearded vulture, the Braſilian vulture, and the king of the vultures of South America.

The *Golden Vulture* ſeems to be the firſt of the kind; and is in many reſpects like the golden eagle, but larger in every proportion. From the end of the beak to that of the tail, it is four feet and an half, and to the end, of the claws forty-five inches. The lower part of the neck, breaſt, and belly, are of a red colour; but on the tail it is more faint, and deeper near the head. The feathers are black on the back; but of a yellowiſh colour on the wings and tail. Others of the kind differ from this in colour and dimenſions; but they are all ſtrongly marked by their naked heads, and beak ſtraight in the beginning, but hooking at the point.

They are ſtill more ſtrongly marked by their nature, which in all vultures is cruel, filthy, and indolent. Their ſenſe of ſmelling, however, is amazingly acute; and Nature, for this purpoſe, has beſtowed upon them two large apertures or noſtrils without, and an extenſive olfactory membrane within. They ſeem adapted inwardly, not only to be carnivorous, but to eat corn, or whatever elſe of that kind they can fall in with.

This bird, which is common in many parts of Europe, and but too well known on the weſtern continent, is unknown in England. In Egypt, Arabia, and many other kingdoms of Africa and Aſia, vultures are found in prodigious numbers. The inſide down of their wing is converted into a very warm and comfortable kind of fur, and is commonly ſold in the Aſiatic markets.

In Egypt, indeed, this bird ſeems to be of ſingular ſervice. There are great flocks of them in the neighbourhood of Grand Cairo, which no perſon is permitted to deſtroy. The ſervice they render to the inhabitants, is devouring all the carrion and filth of that great city; which might otherwiſe tend to corrupt the air. They are for the moſt part ſeen in company with the wild dogs of the country, tearing a carcaſs very deliberately together. This odd aſſociation produces no quarrels. The birds and quadrupeds ſeem to live amicably, and nothing but harmony ſubſiſts between them. The wonder is ſtill the greater, as both are extremely rapacious, and both very lean; probably having but little even of the wretched food on which they ſubſiſt.

In America, they lead a life ſomewhat ſimilar. Wherever the huntſmen, who there only purſue birds for the ſkins, are found to go, theſe birds are ſeen to purſue them. They ſtill hover at a little diſtance; and the moment they ſee the beaſt flayed and left by the huntſmen, they call out to each other, pour down upon the carcaſs, and, pick its bones bare in an inſtant.

The ſloth, the filth, and the voraciouſneſs of theſe birds, are almoſt incredible. In the Braſils, where they are found in great abundance, when they light upon a carcaſs, which they have liberty to tear at their eaſe, they gorge themſelves, till they are unable to fly; and muſt hop along when they are purſued. They are always ſlow and unable to mount eaſily from the ground, but when ſatiated they can hardly move. They do not however continue long in this awkward poſture; for they ſoon diſcharge the contents of their ſtomach by vomit.

It is pleaſant to be a ſpectator of the hoſtilities between animals that are thus hateful or noxious. Of all creatures, the two moſt at enmity, is the vulture of Braſil and the crocodile. The female of this terrible amphibious creature, which in the rivers of that part of the world grows to the ſize of twenty-ſeven feet, lays between one and two hundred eggs, in the ſands, on the ſide of the river, and leaves them to be hatched by the heat of the climate. For this purpoſe, ſhe takes every precaution that the place where ſhe depoſits them may not be diſcovered by any other animal. In the mean time, however a number of vultures, ſit, ſilent and unſeen, in the branches of ſome neighbouring foreſt, and view the crocodile's operations, with the pleaſing expectation of plunder. They patiently wait till the crocodile has laid the whole number of her eggs, till ſhe has covered them carefully under the ſand, and until ſhe is retired from them to a convenient diſtance. Then, encouraging each other with cries, they pour in a body down upon the neſt, hook up the ſand in a moment, and devour the whole brood. Nothing can be more lean, ſtringy, nauſeous, and unſavory than the fleſh of theſe vultures. It is in vain that, when killed, the rump has been cut off; in vain the body has been waſhed, and ſpices uſed to overpower its prevailing odour: it ſtill ſmells and taſtes of the carrion by which it was nouriſhed, and ſends forth a ſtench that is inſupportable. Theſe birds, at leaſt thoſe of Europe, uſually lay two eggs at a time, and produce but once a year. They make their neſts in inacceſſible cliffs, and in places ſo remote that it is almoſt impoſſible to find them.

Of the Falcon kind.

Falconry, which is now ſo much diffuſed among us, was the principal amuſement of our anceſtors. A perſon of rank ſcarce ſtirred out without his hawk on his hand, which in old paintings is the criterion of nobility. The expence which attended this ſport was very great. Among the old Welch princes, the king's falconer was the fourth officer in the ſtate; but, notwithſtanding all his honours, he was forbid to take more than three draughts of beer from his horn, leſt he ſhould get drunk and neglect his duty. In the reign of James the Firſt, Sir Thomas Monſon is ſaid to have given a thouſand pounds for a caſt of hawks; and ſuch was their value in general, that it was made felony in the reign of Edward the Third to ſteal a hawk. To take its eggs, even in a perſon's own ground, was puniſhable with impriſonment for a year and a day, together with a fine at the king's pleaſure.

Of many of the ancient falcons uſed for this purpoſe, we at this time know only the names. Of thoſe in uſe at preſent, both here and in other countries, are the gyr-falcon, the falcon, the lanner, the ſacre, the hobby, the keſtril, and the merlin. Theſe are called the long-winged hawks, to diſtinguiſh them from the goſs-hawk, the ſparrow-hawk, the kite, and the buzzard, which have ſhorter wings and which are either too ſlow, too cowardly, too indolent, or too obſtinate, to contribute to the pleaſures of the field.

The *gyr-falcon* leads in this bold train. He exceeds all other falcons in the largeneſs of his ſize, for he approaches nearly to the magnitude of the eagle. The top of the head is flat, and of an aſh colour, with a ſtrong, thick, ſhort, and blue beak. The feathers of the back and wings are marked with black ſpots, in the ſhape of an heart. He is a courageous and fierce bird, nor is he afraid even of the eagle himſelf; but he chiefly flies from the ſtork, the heron, and the crane. He is moſtly found in the colder regions of the north, but loſes neither his ſtrength nor his courage when introduced into the milder climates.

The *falcon*, properly ſo called, is the ſecond both in ſize and value. There are ſome varieties in this bird; but there ſeem to be only two that claim diſtinction. Theſe are the falcon-gentil and the peregrine-falcon; both of which are far leſs than the gyr, and are about the ſize of a raven. Next in ſize to theſe is the *lanner*, a bird now very little known in Europe. The ſacre follows whoſe legs are of a bluiſh colour and ſerve to diſtinguiſh it. To theſe ſucceeds the hobby, uſed for ſmaller game, for daring larks, and ſtooping at quails. The keſtril was trained for the ſame purpoſes; and laſtly the merlin; which though the ſmalleſt of all the hawk or falcon kind, and not much larger than a thruſh, yet diſplays a degree of courage that renders him formidable even to birds ten times his ſize.

The courage of theſe creatures in general was ſuch, that no bird, which was not very much above their own ſize, could terrify them. Their ſwiftneſs was ſo great, that ſcarce any bird could eſcape them; and their docility ſo remarkable, that they obeyed not only the commands, but the ſigns of their maſter. They remained quietly perched upon his hand till their game was fluſhed, or elſe kept hovering round his head, till he gave them leave to ſeize upon their prey. The common falcon is a bird of ſuch ſpirit, that like a conqueror in a country, he keeps all birds in ſubjection to his proweſs. Where he is ſeen flying wild, as I often had an opportunity of ſeeing him, the birds of every kind, that ſeemed entirely to diſregard the kite or the ſparrow-hawk, fly with ſcreams at his moſt diſtant appearance.

In order to train up a falcon, the maſter begins by putting ſtraps upon his legs, which are called jeſſes, and to which a ring with the owner's name is faſtened. To theſe alſo are added little bells, which often direct the place where he is, if loſt in the chace. He is always carried on the hand, and is obliged to be kept without ſleeping. If he be ſtubborn, and attempt to bite, his head is plunged into water. Thus, by hunger, watching, and fatigue, he is conſtrained to ſubmit to having his head covered by a hood or cowl, which covers his eyes. This troubleſome employment continues often for three days and nights together. It rarely happens but at the end of this, his neceſſities, and the privation of light make him give up every idea of liberty, and overcome his natural wildneſs. His maſter judges of his being tamed when he permits his head to be covered without reſiſtance, and when uncovered he ſeizes the meat before him contentedly. The repetition of theſe leſſons by degrees enſures ſucceſs. His wants being the chief principle of his dependance, it is endeavoured to encreaſe his appetite by giving him little balls of flannel, which he greedily ſwallows. Having thus excited the appetite, care is taken to ſatisfy it; and thus gratitude attaches the bird to the man who but juſt before had been his tormentor.

When the firſt leſſons have ſucceeded, and the bird ſhews ſigns of docility, he is carried out upon ſome green, the head is uncovered, and, by flattering him with food at different times, he is taught to jump to the hand, and to continue on it. When confirmed in this habit, it is then thought time to make him acquainted with the lure. This lure is only a thing ſtuffed like the bird the falcon is deſigned to purſue, ſuch as an heron, a pigeon, or a quail, and on this lure they always take care to give him his food. It is quite neceſſary that the bird ſhould not only be acquainted with this but fond of it. The uſe of this lure is to flatter him back when he has flown in the air, which it ſometimes fails to do; and it is always requiſite to aſſiſt it by the voice and the ſigns of the maſter. When the familiarity and the docility of the bird are ſufficiently confirmed on the green, he is then uncovered as before; and the falconer, calling him at ſome diſtance, ſhews him the lure. When he flies upon it he is permitted to take a large morſel of the food which is tied to it. The next day the lure is ſhewn him at a greater diſtance, till he comes at laſt to fly to it at the utmoſt length of his ſtring. Then the game itſelf which he is to purſue is preſented to him alive, but diſabled or tame. After having ſeized this ſeveral times with his ſtring, he is then left entirely at liberty, and carried into the field for the purpoſes of purſuing that which is wild. At this he flies with avidity; and when he has ſeized it, or killed it, he is brought back by the voice and the lure.

By this method of inſtruction, an hawk may be taught to fly at any game whatſoever; but falconers have chiefly confined their purſuit only to ſuch animals as yield them profit by the capture, or pleaſure in the purſuit. The hare, the partridge, and the quail, repay the trouble of taking them; but the moſt delightful ſport is the falcon's purſuit of the heron, the kite, or the wood lark. Inſtead of flying directly forward, as ſome other birds do, theſe, when they ſee themſelves threatened by the approach of the hawk, immediately take to the ſkies. They fly almoſt perpendicularly upward, while their ardent purſuer keep pace with their flight, and tries to riſe above them. Thus both diminiſh by degrees from the gazing ſpectator below, till they are quite loſt in the clouds; but they are ſoon ſeen deſcending, ſtruggling together,

gether, and uſing every effort on both ſides; the one of rapacious inſult, the other of deſperate defence. The unequal combat is ſoon at an end: the falcon comes off victorious, and the other, killed or diſabled, falls a prey either to the bird or to the ſportſman.

Reſpecting other birds, they are not ſo much purſued, as they generally fly ſtraight forward, by which the ſportſman loſes ſight of the chace and what is ſtill worſe, runs a chance of loſing his falcon too. The purſuit of the lark by a couple of merlins is conſidered, by him only who regards the ſagacity of the chace, as one of the moſt delightful ſpectacles this exerciſe can afford. The amuſement is, to ſee one of the merlins climbing to get the aſcendant of the lark, while the other, lying low for the beſt advantage, waits the ſucceſs of its companion's efforts. Hence whilſt the one ſtoops to ſtrike its prey, the other ſeizes it as it deſcends.

The more ignoble race of birds make up by cunning and aſſiduity what theſe claim by force and celerity. The kite, which may be diſtinguiſhed from all the reſt of this tribe by his forky tail, and his ſlow floating motion, ſeems almoſt continually upon the wing. He lives only upon accidental carnage, as almoſt every bird in the air is able to make good his retreat againſt him. He may be therefore conſidered as an inſidious thief who only prowls about, and, when he finds a ſmall bird wounded, or a young chicken ſtrayed too far from its dam, inſtantly avails itſelf of the opportunity, and, like a famiſhed glutton, is ſure to ſhew no mercy. His hunger, indeed, often urges him to acts of ſeeming deſperation. I have ſeen one of them fly round and round for a while to mark a clutch of chickens, and then on a ſudden dart like lightning upon the innocent little animal, and carry it off; the hen venting her indignation in vain, and the boys hooting and caſting ſtones to ſcare it from its plunder. Of all birds therefore the kite is the good houſewife's greateſt enemy.

Of all obſcene birds, the Kite is the beſt known; but the buzzard among us is the moſt common. He is a ſluggiſh, inactive bird, and often continues perched whole days together upon the ſame bough. He is rather an aſſaſſin than a purſuer; and lives more upon frogs, mice, and inſects, which he can eaſily ſeize, than upon birds which he is obliged to follow. He lives in ſummer by robbing the neſts of other birds, and ſucking their eggs, and more reſembles the owl kind in his countenance than any other rapacious bird of day. The goſs-hawk and ſparrow-hawk are what Mr Willoughby calls ſhort-winged birds, and conſequently unfit for training, however injurious they may be to the pigeon-houſe or the ſportſman. They have been indeed taught to fly at game; but little is to be obtained from their efforts, as they are averſe to inſtruction.

The Butcher Bird.

Before I conclude this ſhort hiſtory of rapacious birds that prey by day, I muſt beg leave to deſcribe a tribe of ſmaller birds, which ſeem from their ſize rather to be claſſed with the harmleſs order of the ſparrow-kind; but which from their crooked beak, courage and appetites for ſlaughter, certainly deſerve a place here. The leſſer butcher-bird is not much above the ſize of a lark; and that of the ſmalleſt ſpecies is not ſo big as a ſparrow; yet, diminutive as theſe little animals are, they make themſelves formidable to birds of four times their ſize.

The greater butcher-bird is about as large as a thruſh: its bill is black, an inch long, and hooked at the end. At the ſame time its legs and feet are ſlender, and its toes are formed rather like thoſe of ſuch as live chiefly upon inſects and grain. Its habits, indeed, ſeem to correſpond with its conformation, and it lives as well upon fleſh as upon inſects. Its appetite for fleſh, however, is the moſt prevalent; and it never takes up with the former when it can obtain the latter. This bird, therefore, leads a life of continual combat and oppoſition. As from its ſize it does not much terrify the ſmaller birds of the foreſt, ſo it very frequently meets birds willing to try its ſtrength, and it never declines the engagement.

It is wonderful to ſee with what intrepidity this little creature goes to war with the pie, the crow, and the keſtril, all above four times larger than itſelf. It not only fights upon the defenſive, but often gives the attack, and always with advantage, particularly when the male and female unite to protect their young, and to expel the more powerful birds. At that ſeaſon, they do not wait the approach of their invader; it is ſufficient that they ſee him preparing for the aſſault at a diſtance. It is then that they ſally forth with loud cries, wound him on every ſide, and drive him off with ſuch fury, that he ſeldom ventures to return to the charge. In theſe diſputes, they generally obtain the victory; though it ſometimes happens that they fall to the ground with the bird they have ſo fiercely fixed upon, and the combat ends with the deſtruction of the aſſailant as well as of the defender.

For this reaſon, the chief birds of prey reſpect them; while the kite, the buzzard, and the crow, ſeem rather to fear than to deſire the engagement. Nothing in nature better diſplays the reſpect paid to the claims of courage, than to ſee this little bird, apparently ſo contemptible, fly in company with the lanner, the falcon, and all the tyrants of the air, without dreading their ſtrength, or avoiding their reſentment.

Small birds are its uſual food. It ſeizes them by the throat, and ſtrangles them in an inſtant. When it has thus killed the bird or inſect, it is aſſerted by the beſt authority, that it fixes them upon ſome neighbouring thorn, and, when thus ſpitted, pulls them to pieces with its bill. It is ſuppoſed that as Nature has not given this bird ſtrength ſufficient to tear its prey to pieces with its feet, as the hawks do, it is obliged to have recourſe to this expedient.

During ſummer, ſuch of them as conſtantly reſide here, for the ſmaller red butcher-bird migrates, remain among the mountainous parts of the country; but in winter they deſcend into the plains and approach nearer the habitations of men. The larger kinds make their neſts on the higheſt trees, while the leſſer build in buſhes in the fields and hedge-rows. They both lay about ſix eggs, of a white colour, but encircled at the larger end with a ring of browniſh red. The neſt on the outſide is compoſed of white moſs, interwoven with long graſs; within, it is well lined with wool, and it is uſually fixed among the forking branches of a tree. The female feeds her young at the firſt with catterpillers and other inſects; but ſoon after accuſtoms them to fleſh, which the male procures with ſurpriſing induſtry. Their nature alſo is very different from that of other birds of prey in their paternal care; for, ſo far from driving out their young from the neſt to ſhift for themſelves, they keep them with care; and even when adult they do not forſake them, but the whole brood live in one family together. Each family lives apart, and is generally compoſed of the male, female, and five or ſix young ones. Theſe all maintain peace and ſubordination among each other, and hunt in concert. It is eaſy to diſtinguiſh theſe birds at a diſtance, not only from their being in flocks, but alſo from their manner of flying, which is for the moſt part up and down, ſeldom direct or ſide-ways.

Of theſe birds there are three or four different kinds; but the greater aſh-coloured butcher-bird is the leaſt known among us. The red backed butcher-bird migrates in autumn, and does not return till ſpring. The woodchat reſembles the former, except in the colour of the back, which is brown, and not red as in the other. There is ſtill another, leſs than either of the former, found in the marſhes near London. This too is a bird of prey, although not much bigger than a tit-mouſe; an evident proof that an animal's courage or rapacity does not depend upon its ſize.

The Owl Kind.

All birds of this kind have one common mark, by which they are diſtinguiſhed from other birds; for their eyes, like thoſe of tigers and cats, are formed for ſeeing better in the duſk, than in the broad glare of ſun-ſhine. The pupil in fact is capable of great dilatation or contraction. By contracting it, the brighter light of the day, which would act too powerfully upon the ſenſibility of the eye, is excluded; while by dilating the pupil, the animal takes in the more faint rays of the night, by which it is enabled to ſpy its prey, and catch it with greater eaſe in the dark.

But though owls are dazzled by too bright a day-light, yet they do not ſee beſt in the darkeſt nights, as ſome have been inclined to imagine.

The nights when the moon ſhines are the times of their moſt ſucceſsful plunder; for when it is wholly dark, they are leſs qualified for ſeeing and purſuing their prey. Except, therefore by moonlight, they abridge the hours of their chace. If, however, they come out at the approach of duſk in the evening, they return before it is totally dark, and then riſe by twilight next morning, to purſue their game, and to return, in like manner, before the broad day-light begins to dazzle them with its ſplendor.

Yet the faculty of ſeeing in the night, or of being entirely dazzled by day, is not alike in every ſpecies of theſe nocturnal birds. The common White or Barn Owl, for inſtance, ſees with ſuch exquiſite acuteneſs in the dark, that though the barn has been ſhut at night, and the light thus totally excluded, yet it perceives the ſmalleſt mouſe that peeps from its hole. The brown horned owl on the other hand, is often ſeen to prowl along the hedges by day, like the ſparrow-hawk; and ſometimes with good ſucceſs.

All birds of the owl kind may be divided into two ſorts; thoſe which have horns, and thoſe which want them. Theſe horns are nothing more than two or three feathers that ſtand up on each ſide of the head over the ear, and give this animal a kind of horned appearance. Of the horned kind; is the *great horned owl*, which at firſt view appears as large as an eagle, though when more narrowly inſpected he will be found much leſs. His eyes are large and tranſparent, encircled with an orange-coloured iris. His ears are large and deep: his plumage is of a reddiſh brown, marked on the back with black and yellow ſpots, and is yellow only upon the belly.

Next to this is the *common horned owl*, of a much ſmaller ſize than the former, and with horns much ſhorter. As the great owl was five feet from the tip of one wing to the other, this is but three. The horns are but about an inch long, and conſiſt of ſix feathers, variegated with black and yellow.

There is ſtill a ſmaller kind of the horned owl, which is not much larger than a black-bird; and whoſe horns are remarkably ſhort, being compoſed but of one feather, and that not above half an inch high.

To theſe ſucceeds the tribe without horns. 1. The *howlet*, which is the largeſt of this kind, with duſky plumes, and black eyes. 2. The *ſcreech owl*, which is of a ſmaller ſize, with blue eyes, and plumage of an iron grey. 3. The *white owl*, which is about as large as the former, with yellow eyes and whitiſh plumage. 4. The *great brown owl* which is leſs than the former, with brown plumage and a brown beak; and laſtly, the *little brown owl*, which has yellowiſh-coloured eyes, and an orange-coloured bill.

All this tribe of animals, however they may differ in their ſize and plumage, agree in their general characteriſtics of preying by night. Their bodies are ſtrong and muſcular: their feet and claws are made for tearing their prey; and their ſtomachs for digeſting it. It muſt be remarked, however, that the digeſtion of all birds that live upon mice, lizards, or ſuch like food, is not very perfect; for though they ſwallow them whole, yet they are always ſeen ſome time after to diſgorge the ſkin and bones, rolled up in a pellet, as being indigeſtible.

As they are incapable of ſupporting the light of the day, or at leaſt of then ſeeing and readily avoiding their danger, they ſhut themſelves up during the day, in ſome obſcure retreat, ſuited to their gloomy appetites, where they continue in ſolitude and ſilence. The cavern of a rock, the darkeſt part of an hollow tree, the battlements of a ruined caſtle, ſome obſcure hole in a farmer's out-houſe, are their uſual abodes. If they be ſeen out of theſe retreats in the day time, they may be conſidered as having loſt their way; as having by ſome accident been thrown into the midſt of their enemies, and ſurrounded with danger.

In this diſtreſs they are obliged to take ſhelter in the firſt tree or hedge that offers, till the returning darkneſs once more ſupplies them with a better plan of the country. But it too often happens that, with all their precaution to conceal themſelves, they are ſpied out by other birds, and are ſure to receive no mercy. The black-bird, the thruſh, the jay, the bunting, and the red-breaſt, all come in file, and employ their little arts of inſult and abuſe. The ſmalleſt, the feebleſt, and the moſt contemptible of this unfortunate bird's enemies, are then the firſt to injure and torment him. They encreaſe their cries and turbulence round him, flap him with their wings, and are ready to ſhew their courage to be great, as they are ſenſible that their danger is but ſmall. The unfortunate owl, not knowing where to attack or where to fly, patiently ſits and ſuffers all their inſults. Aſtoniſhed and dizzy, he only replies to their mockeries by awkward and ridiculous geſtures, by turning his head, and rolling his eyes with an air of ſtupidity. It is enough that an owl appears by day to ſet the whole grove into a kind of uproar. Either the averſion all the ſmall birds entertain againſt this animal, or the conſciouſneſs of their own ſecurity, makes them purſue him without ceaſing, whilſt they encourage each other by their mutual cries to lend aſſiſtance in this laudable undertaking.

It ſometimes happens, however, that the little birds purſue their inſults with the ſame imprudent zeal which the owl himſelf had purſued his depredations. They hunt him the whole day; but when night returns, he makes his purſuers pay dear for their former ſport: nor is man always an unconcerned ſpectator. The bird catchers have got an art of counterfeiting the cry of the owl exactly; and, having before limed the branches of an hedge, they ſit unſeen and give the call. At this, all the little birds flock to the place where they expect to find their well-known enemy; but inſtead of finding their ſtupid antagoniſt, they are ſtuck faſt to the hedge themſelves. This ſport muſt be put in practice an hour before night-fall, and in order to ſucceed; for if it is put off till later, thoſe birds which but a few minutes ſooner came to provoke their enemy, will then fly from him with as much terror as they juſt before ſhewed inſolence.

It is not unpleaſant to ſee one ſtupid bird made in ſome ſort a decoy to deceive another. The great horned owl is ſometimes made uſe of for this purpoſe, to lure the kite, when falconers deſire to catch him for the purpoſes of training the falcon. Upon this occaſion they clap the tail of a fox to the great owl, to render his figure extraordinary; in which trim he ſails ſlowly along, flying low, which is his uſual manner. The kite, either curious to obſerve this odd kind of animal, or perhaps inquiſitive to ſee whither it may not be proper for food, flies after, and approaches nearer and nearer. In this manner he continues to hover, and ſometimes to deſcend, till the falconer ſetting a ſtrong-winged hawk againſt him, ſeizes him for the purpoſe of training his young at home.

The uſual place where the great horned owl breeds is in the cavern of a rock, the hollow of a tree, or the turret of ſome ruined caſtle. Its neſt is near three feet in diameter, and compoſed of ſticks, bound together by the fibrous roots of trees, and lined with leaves on the inſide. It lays about three eggs, which are larger than thoſe of an hen, and of a colour ſomewhat reſembling the bird itſelf. The leſſer owl of this kind never makes a neſt for itſelf, but always contents itſelf with the old neſt of ſome other bird, which it has often been forced to abandon. It lays four or five eggs; and the young are all white at firſt, but change their colour in about a fortnight. The other owls in general build near the place where they chiefly prey; that which feeds upon birds in ſome neighbouring grove, that which preys chiefly upon mice near ſome farmer's yard, where the proprietor of the place takes care to afford it perfect ſecurity. In fact, whatever miſchief one ſpecies of owl may do in the woods, the barn-owl compenſates recompenſe for it, by being equally active in deſtroying mice nearer home. A ſingle owl is therefore ſaid to be more ſerviceable than half a dozen cats in ridding the barn of its domeſtic vermin. "In the year 1580," ſays an old writer, "at Hallontide, an army of mice ſo over-run the marſhes near Southminſter,

minſter, that they ate up the graſs to the very roots. But at length a great number of ſtrange painted owls came and devoured all the mice. The like happened again in Eſſex about ſixty years after."

C H A P. XXIV.

OF BIRDS OF THE POULTRY KIND—THE COCK—THE PEACOCK—THE TURKEY—THE PHEASANT—THE GUINEA FOWL—THE BUSTARD—THD GROUS, BLACK GAME, &C.—THE PARTRIDGE—THE QUAIL.

The Cock.

OF all birds the cock ſeems to be the oldeſt companion of mankind, to have been firſt reclaimed from the foreſt, and taken to ſupply the accidental failure of the luxuries or neceſſities of life. As he has been longeſt under the care of man, ſo perhaps he exhibits the greateſt number of varieties, there being ſcarcely two birds of this ſpecies that exactly reſemble each other in plumage and form.

It is not well aſcertained when the cock firſt became a domeſtic in Europe; but it is generally agreed that we firſt had him in our weſtern world from the kingdom of Perſia. The cock is found wild in the iſland of Tinian and in many others of the Indian ocean, and in the woods on the coaſts of Malabar. His plumage is black and yellow, and his comb and wattles are yellow and purple. There is another peculiarity alſo in thoſe of the Indian woods. Their bones which when boiled with us are white, as every body knows, in thoſe are as black as ebony. Whether this tincture proceeds from their food, as the bones are tinctured red by feeding upon madder, I leave to the diſcuſſion of others.

At their firſt propagation in Europe, there were diſtinctions which are not now. The ancients eſteemed thoſe fowls whoſe plumage was reddiſh as invaluable. Thoſe on the other hand, whoſe plumage was white, were conſidered as quite unfit for domeſtic purpoſes. No animal in the world has greater courage than the cock when oppoſed to one of his own ſpecies; and in every part of the world where refinement and poliſhed manners have not entirely taken place, cock-fighting is a principal diverſion. In China, India, the Philippine Iſlands, and all over the eaſt, cock-fighting is the ſport and amuſement of kings and princes. With us it is declining every day; and it is to be hoped it will in time become only the paſtime of the loweſt and vulgar. It is the opinion of many that we have a bolder and more valiant breed than is to be found elſewhere. The truth however, is, they have cocks in China as bold, if not bolder, than ours; and, what would be conſidered as valuable among cockers here, they have more ſtrength with leſs weight.

The hen ſeldom clutches a brood of chickens above once a ſeaſon, though inſtances have been known in which they have produced two. The number of eggs a domeſtic hen will lay in the year are above two hundred, provided ſhe be well fed, and have her liberty. It matters not much whether ſhe be trodden by the cock or no; ſhe will continue to lay, although all the eggs of this kind can never by hatching be brought to produce a living animal. Her neſt is made without any care, if left to herſelf; a hole ſcratched into the ground, among a few buſhes, is the only preparation ſhe makes for this ſeaſon of patient expectation. Nature, almoſt exhauſted by its own fecundity, ſeems to inform her of the proper time for hatching, which ſhe herſelf teſtifies by a clucking note, and by diſcontinuing to lay. If left entirely to herſelf, the hen would ſeldom lay above twenty eggs in the ſame neſt, without attempting to hatch them. While ſhe ſits, ſhe carefully turns her eggs, and even removes them to different ſituations; till at length, in about three weeks the young brood begin to give ſigns of a deſire to burſt from their confinement. When by the repeated efforts of their bill, they have forced a paſſage through the ſhell. The ſtrongeſt and beſt chickens generally are the firſt candidates for liberty; the weakeſt come behind, and ſome even die in the ſhell. When all are produced, ſhe then leads them forth to provide for themſelves. Her affection and her pride ſeem then to alter her very nature, and correct her imperfections. No longer voracious or cowardly, ſhe abſtains from all food that her young can ſwallow, and boldly defends them from the attack of every creature that ſhe imagines may injure them.

Ten or twelve chickens are the greateſt number that a good hen can rear and clutch at a time; but as this bears no proportion to the number of her eggs, ſchemes have been imagined to clutch all the eggs of an hen, and thus turn her produce to the greateſt advantage. The contrivance I mean is the artificial method of hatching chickens in ſtoves, as is practiſed at Grand Cairo; or in a chymical elaboratory properly graduated, as has been effected by Mr Reaumur. At Grand Cairo, they in this manner produce ſix or ſeven thouſand chickens at a time; where, as they are brought forth in their ſpring, which is warmer than our ſummer, the young ones thrive without clutching. But it is otherwiſe in our colder and unequal climate; the little animal may, without much difficulty, be hatched from the ſhell; but they almoſt all periſh when excluded. The cock is a ſhort-lived animal; but how long theſe birds live, if left to themſelves, is not yet well aſcertained by any hiſtorian. As they are kept only for profit, and in a few years become unfit for generation, there are few that, from mere motives of curioſity, will make the tedious experiment of maintaining a proper number till they die. Aldrovandus hints that they would live ten years; and it is probable that this may be its extent.

The Peacock.

The Peacock, by the common people of Italy, is ſaid to have the plumage of an angel, the voice of a devil and the guts of a thief. Our firſt peacocks were brought from the Eaſt-Indies; and we are aſſured, that they are ſtill found in vaſt flocks, in a wild ſtate, in the iſlands of Java and Ceylon.

The peacock has in ſome countries been eſteemed as an article of luxury, but whatever there may be of delicacy in the fleſh of a young peacock, it is certain an old one is very unpalatable.

Its fame for delicacy, however, did not continue very long; for we find, in the time of Francis the Firſt, that it was a cuſtom to ſerve up peacocks to the tables of the great, merely to be ſeen. Their manner was to ſtrip off the ſkin; and then preparing the body with the warmeſt ſpices, they covered it up again in its former ſkin, with all its plumage in full diſplay, and no way injured by the preparation. The bird thus prepared, was often preſerved for many years without corrupting; and it is aſſerted that the peacock's fleſh keeps longer unputrified than that of any other animal. At ſplendid entertainments, particularly at weddings, they filled the bird's beak and throat with cotton and camphire which they ſet on fire to amuſe the company.

Like other birds of the poultry kind, the peacock feeds upon corn; but barley is its favourite food. But there is ſcarcely any food that it will not at times covet and purſue. In the indulgence of theſe capricious purſuits, walls cannot eaſily confine it: it ſtrips the tops of houſes of their tiles or thatch, it lays waſte the labours of the gardener, roots up his choiceſt ſeeds, and nips his favourite flowers in the bud. Thus its beauty but ill recompenſes for the miſchief it does; and many of the more homely looking fowls are very deſervedly preferred before it.

The pea-hen ſeldom lays above five or ſix eggs in this climate before ſhe ſits. Ariſtotle repreſents her as laying twelve; and it is probable, that in her native climate, ſhe does ſo: for it is certain, that in the foreſts where they breed naturally, they are numerous beyond expreſſion. The bird lives about twenty years; and not till its third year has it that beautiful variegated plumage that adorns its tail.

The Turkey.

The natal place of the cock and the peacock is pretty well aſcertained, but there are ſtronger doubts concerning the turkey. Some contend that it has been brought into Europe from the Eaſt-Indies many centuries ago. Others aſſert, that it is wholly unknown in that part of the world, that it is a native of the New Continent, and that it was not brought into Europe till the diſcovery of that part of the world.

With us, when young, they are the tendereſt of all birds; yet, in their wild ſtate, they abound in the foreſts of Canada, which are covered with ſnow above three parts of the year. In their natural woods, they are found much larger than in their ſtate of ſtomeſtic captivity. They are much more beautiful alſo, their feathers being of a dark grey, bordered at the edges with a bright gold colour. Theſe the ſavages of the country weave into cloaks to adorn their perſons, and faſhion into fans and umbrellas, but never once think of domeſticating animals that the woods furniſh them with in ſufficient abundance. Savage man ſeems to find a delight in precarious poſſeſſion. The hunting of the turkey, therefore, makes one of his principal diverſions; as its fleſh contributes chiefly to the ſupport of his family. When he has diſcovered the place of their retreat, which, in general, is near fields of nettles, or where there is plenty of any kind of grain, he takes his dog, which is trained to the ſport, and ſends him into the midſt of the flock. The turkies no ſooner perceive their enemy, than they run off at full ſpeed, and with ſuch amazing ſwiftneſs that they far outſtrip the dogs. He continues his purſuit however, and ſenſible they muſt ſoon be tired, as they cannot go faſt for any length of time, he, at laſt, forces them to take ſhelter in a tree, where they ſit quite ſpent and fatigued, till the huntſman comes up, and with a long pole, knocks them down.

This manner of ſuffering themſelves to be deſtroyed, argues no great inſtinct in the animal; and indeed, in their captive ſtate, they do not appear to be poſſeſſed of much. They ſeem a ſtupid, vain, querulous tribe, apt enough to quarrel among themſelves, although deſtitute of any hurtful weapons. Every body knows the ſtrange antipathy the turkey-cock has to a red colour. But there is another method of increaſing the animoſity of theſe birds againſt each other, which is often practiſed by boys, when they have a mind for a battle. This is no more than to ſmear over the head of one of the turkies with dirt, and the reſt run to attack it with all the ſpeed of impotent animoſity: nay, two of them thus diſguiſed, will fight each other till they are almoſt ſuffocated with fatigue and anger.

But though ſo furious among themſelves, they are weak and cowardly againſt other animals. The cock often makes the turkey keep at a diſtance; and they ſeldom venture to attack him but with united force, when they rather oppreſs him by their weight, than annoy him by their arms. There is no animal, how contemptible ſoever, that will venture boldly to face the turkey-cock, that he will not fly from. On the contrary, with the inſolence of a bully, he purſues any thing that ſeems to fear him, particularly lap dogs and children, againſt both which he ſeems to have a peculiar averſion.

The female ſeems of a milder, gentler diſpoſition. She lays eighteen or twenty eggs. Her young muſt be carefully fed with curd chopped with dock leaves; but as they grow older, they become more hardy, and follow the dam to conſiderable diſtances, in purſuit of inſect food, which they prefer to any other. When once grown up, turkeys are very hardy birds, and feed themſelves with very little expence to the farmer. Thoſe of Norfolk are ſaid to be the largeſt of this kingdom, weighing from twenty to thirty pounds. There are places, however, in the Eaſt Indies, where, in their domeſtic ſtate, they grow to the weight of ſixty pounds.

The Pheaſant.

It would ſurpriſe the ſportſman to be told that the pheaſant which he finds wild in the woods, in the remoteſt parts of the kingdom, is a foreign bird, and was at firſt artificially propagated among us. They were brought into Europe from the banks of the Phaſis, a river of Colchis, in Aſia Minor, from which they take their name.

Next to the peacock, they are the moſt beautiful birds, as well for the vivid colour of their plumes, as for their happy mixtures and variety. It is far beyond the power of the pencil to draw any thing ſo gloſſy, ſo bright, or with points ſo finely blending into each other. We are told that when Crœſus, king of Lydia, was ſeated on his throne, adorned with royal magnificence, and all the barbarous pomp of eaſtern ſplendour, he aſked Solon if he had ever beheld any thing ſo fine! The Greek philoſopher, taking a pride in his native ſimplicity, replied, that after having ſeen the beautiful plumage of the pheaſant he could be aſtoniſhed at no other finery.

In fact, nothing can ſatisfy the eye with a greater variety and richneſs of ornament than this beautiful creature. The iris of the eyes is yellow; and the eyes themſelves are ſurrounded with a ſcarlet colour, with ſmall ſpecks of black. On the fore-part of the head there are blackiſh feathers mixed with a ſhining purple. The top of the head and the upper part of the neck are tinged with a darkiſh green that ſhines like ſilk. In ſome, the top of the head is of a ſhining blue, and the head itſelf, as well as the upper part of the neck, appears ſometimes blue and ſometimes green, as it is differently preſented to the eye of the ſpectator. The feathers of the breaſt, the ſhoulders, the middle of the back, and the ſides under the wings, have a blackiſh ground, with edges tinged of an exquiſite colour, which appears ſometimes black and ſometimes purple, according to the different lights in which it is viewed. Under the purple there is a tranſverſe ſtreak of gold colour. The tail, from the middle feathers to the root, is about eighteen inches long: the legs, the feet, and the toes, are of the colour of horn. There are black ſpurs on the legs, ſhorter than thoſe of a cock: there is alſo a membrane that connects two of the toes together; and the male is much more beautiful than the female.

This bird, though ſo beautiful to the eye, is not leſs delicate when ſerved up to the table. Its fleſh is conſidered as the greateſt dainty; and when the old phyſicians ſpoke of the wholeſomeneſs of any viands, they made their compariſon with the fleſh of the pheaſant. In the woods, the hen pheaſant lays from eighteen to twenty eggs in a ſeaſon; but in a domeſtic ſtate ſhe ſeldom lays above ten. Its fecundity when wild is ſufficient to ſtock the foreſt; its beautiful plumage adorns it; and its fleſh retains a higher flavour from its unlimited freedom.

The pheaſant, when full grown, ſeems to feed indifferently upon every thing that offers. It is ſaid by a French writer, that one of the king's ſportſmen ſhooting at a parcel of crows, that were gathered round a dead carcaſe, to his great ſurpriſe upon coming up, found that he had killed as many pheaſants as crows. It is even aſſerted by ſome, that ſuch is the carnivorous diſpoſition of this bird, that when ſeveral of them are put together in the ſame yard, if one of them happen to fall ſick, or ſeem to be pining, that the reſt will devour it.

Of the pheaſant, as of all other domeſtic fowls, there are many varieties. There are white pheaſants, creſted pheaſants, ſpotted pheaſants; but of all others, the golden pheaſant of China is the moſt beautiful. It is even a doubt whether the peacock itſelf can bear the compariſon.

The Pintada or Guinea-Hen.

This is a very remarkable bird, and in ſome meaſure unites the characteriſtics of the pheaſant and the turkey. It has the fine delicate ſhape of the one, and the bare head of the other. To be more particular, it is about the ſize of a common hen; but as it is ſupported on longer legs, it appears much larger. It has a round back, with a tail turned downwards like a partridge. The head is covered with a kind of caſque; and the whole plumage is black or dark grey, ſpeckled with white ſpots. It has wattles under the bill, which do not proceed from the lower chap as in cocks, but from the upper, which gives it a very peculiar air, while its reſtleſs gait and odd chuckling ſound diſtinguiſh it ſufficiently from any other bird whatever.

It is well known all over Europe, and we find it under different names in different countries, from the place whence they had it. We have given it the name of that part of Africa from whence probably it was firſt brought.

In many parts of their native country, they are ſeen in vaſt flocks together, feeding their young, and leading them in queſt of food. All their habits are like thoſe of the poultry kind, and they agree in every other reſpect, except that the male and female are ſo much alike, that they can hardly be diſtinguiſhed when they are ſeparate. Their eggs, like their bodies, are ſpeckled; in our climate, they lay but five or ſix in a ſeaſon; but they are far more prolific in their own ſultry regions.

The Buſtard.

The Buſtard is the largeſt land-bird that is a native of Britain. It was once much more numerous than it is at preſent; but the increaſed cultivation of the country, and the extreme delicacy of its fleſh, has greatly thinned the ſpecies. The period, therefore, may come when it may be doubted whether ever ſo large a bird was bred among us. It is probable that long before this the buſtard would have been extirpated, but for its peculiar manner of feeding. It inhabits only the open and extenſive plain, where its food lies in abundance, and where every invader may be ſeen at a diſtance.

The buſtard is much larger than the turkey, the male generally weighing from twenty-five to twenty-ſeven pounds. The neck is a foot long, and the legs are a foot and a half. The wings are not proportionable to the reſt of the body, being but four feet from the tip of the one to that of the other; for which reaſon the bird flies with great difficulty. The head and neck of the male are aſh-coloured: the back is barred tranſverſely with black, bright, and ruſt colour. The greater quill feathers are black; the belly is white; and the tail, which conſiſts of twenty feathers, is marked with broad black bars.

The buſtards are frequently ſeen in flocks of fifty or more, in the extenſive downs of Saliſbury Plain, in the heaths of Suſſex and Cambridgeſhire, the Dorſetſhire uplands, as far as Eaſt Lothian in Scotland. In thoſe extenſive plains, where there are no woods to ſcreen the ſportſman, nor hedges to creep along, the buſtards enjoy an indolent ſecurity. Their food conſiſts of the berries that grow among the heath, and the large earth-worms that appear in great quantities on the downs before ſun-riſing in ſummer. It is in vain that the fowler creeps forward to approach them, they have always centinels placed at proper eminences, which are ever on the watch, and warn the flock of the ſmalleſt appearance of danger. All therefore that is left the ſportſman, is the comfortleſs view of their diſtant ſecurity. He may wiſh, but they are in ſafety.

It ſometimes happens that theſe birds, though they are ſeldom ſhot by the gun, are run down by grey-hounds. As they are voracious and greedy, they often ſacrifice their ſafety to their appetite, and feed themſelves ſo very fat, that they are unable to fly without great preparation. When the grey-hound, therefore, comes within a certain diſtance, the buſtard runs off flapping its wings, and endeavours to gather air enough under them to riſe. In the mean time, the enemy approaches nearer and nearer, till it is too late for the bird even to think of obtaining ſafety by flight; for juſt at the riſe there is always time loſt, of which the bird is ſenſible. It continues, therefore, on the foot until it has got a ſufficient way before the dog for flight, or until it is taken.

As there are but few places where they can at once find proper food and ſecurity, ſo they generally continue near their old haunts; and ſeldom wander above twenty or thirty miles from home. As their food is replete with moiſture, it enables them to live upon theſe dry plains, where there are ſcarcely any ſprings of water. Beſides this, Nature has given the males an admirable magazine for their ſecurity againſt thirſt. This is a pouch, the entrance of which lies immediately under the tongue, and capable of holding near ſeven quarts of water. This is probably filled upon proper occaſions, to ſupply the hen when ſitting, or the young before they can fly.

They make their neſts upon the ground, only juſt ſcraping a hole in the earth, and ſometimes lining it with a little long graſs or ſtraw. There they lay two eggs only, almoſt of the ſize of a gooſe-egg, of a pale olive brown, marked with ſpots of a darker colour. They hatch for about five weeks, and the young ones run about as ſoon as they are out of the ſhell.

The Cock of the wood, the *Black Cock*, the *Grous*, and the *Ptarmigan*—Are all birds of a ſimilar nature, and are chiefly found in heathy mountains and piny foreſts, far removed from the abodes of men. They might once indeed have been common enough over all England, when a great part of that country was covered with heath; but at preſent their numbers are thinned. The two firſt of this kind are utterly unknown in the ſouth, and have taken refuge in the northern parts of Scotland, where the extenſive heaths afford them ſecurity, and the foreſts ſhelter.

The cock of the wood is ſometimes of the ſize of a turkey, and often weighs near fourteen pounds. The black cock, of which the male is jet black, though the female is of the colour of a partridge, is about the ſize of a hen, and, like the former is only found with us in the Highlands of Scotland. The grous is about half as large again as a partridge, and its colour is much like that of a wood-cock, but redder.

The ptarmigan is ſtill ſomewhat leſs, and is of a pale brown or aſh colour. They are all diſtinguiſhable from other birds of the poultry kind, by a naked ſkin, of a ſcarlet colour, above the eyes, in the place and of the figure of eye-brows.

The *cock* of the *wood*, when in the foreſt, attaches himſelf principally to the oak and the pine tree; the cones of the latter ſerving for his food, and the thick boughs for his abode. He feeds alſo upon ants eggs, which ſeem a high delicacy to all birds of the poultry kind: cranberries are likewiſe often found in his crop. The female is much leſs than her mate, and entirely unlike him in plumage, ſo that ſhe might be miſtaken for a bird of another ſpecies. She ſeldom lays more than ſix or ſeven eggs, which are white, and marked with yellow, of the ſize of a common hen's egg. She generally lays them in a dry place and a moſſy ground; and when ſhe is obliged, during the time of incubation, to leave her eggs in queſt of food, ſhe covers them up ſo artfully, with moſs or dry leaves, that it is extremely difficult to diſcover them.

As ſoon as the young ones are hatched, they run with extreme agility after the dam, though ſometimes they are not entirely diſengaged from the ſhell. They ſoon arrive at maturity. They are an hardy bird, their food lies every where before them, and it would ſeem that they ſhould increaſe in great abundance. But this is not the caſe; their numbers are thinned by rapacious birds and beaſts of every kind; and ſtill more by their own ſalacious conteſts. They fight each other, like game cocks; and are ſo inattentive to their own ſafety, that it often happens that two or three of them are killed at a ſhot. It is probable, that in theſe conteſts, the bird which comes off victorious takes poſſeſſion of the female ſeraglio; for it is certain they have no faithful attachments.

Of Partridges.

Of Partridges there are two kinds; the grey and the red. The red partridge is the largeſt of the two, and often perches upon trees; the grey, with which we are beſt acquainted in England, is moſt prolific, and always keeps on the ground.

The partridge ſeems to be a bird well known all over the world, as it is found in every country, and in every climate. It even ſeems to adapt itſelf to the nature of the climate where it reſides. In Greenland, the partridge, which is brown in ſummer, as ſoon as the icy winter commences, begins to take a covering ſuited to the ſeaſon. It is then clothed with a warm down beneath; and its outward plumage aſſumes the colour of the ſnows amongſt which it ſeeks its food. The manners of the partridge in moſt circumſtances, reſemble thoſe of the poultry in general; but their cunning and inſtinct ſeems ſuperior to thoſe of the larger kinds. Perhaps, as they live in the very neighbourhood of their enemies, they have more frequent occaſion to put their little arts in practice; and learn, by habit, the means of evaſion or ſafety. Whenever, therefore, a dog or other formidable animal approaches their neſt, the female uſes every artifice in order to entice him away. She keeps juſt before him, pretends to be incapable of flying, juſt hops up, and then falls down before him, but never goes off ſo far as to diſcourage her purſuer. At length, when ſhe has allured him entirely away from her ſecret treaſure, ſhe at once takes wing, and fairly leaves him to gaze after her in deſpair.

When the danger is over, and the dog withdrawn, ſhe then calls her young who aſſemble at once at her cry, and follow her. Generally there are from ten to fifteen in a covey; and, if unmoleſted, they live about ſixteen or ſeventeen years.

The Quail.

The Quail is a bird much ſmaller than any of the former, being not above half the ſize of a partridge. The feathers of the head are black, edged with ruſty brown. The breaſt is of a pale yellowiſh red, ſpotted with black. The feathers on the back are marked with lines of pale yellow, and the legs are of a pale hue.

Every body knows that the quail is a bird of paſſage; and yet if we conſider its heavy manner of flying, and its dearth of plumage, with reſpect to its corpulence, we ſhall be ſurpriſed how a bird ſo apparently ill qualified for migration, ſhould take ſuch extenſive journeys. Nothing however is more certain. "When we ſailed from Rhodes to Alexandria," ſays Bellonius, "about autumn, many quails, flying from the north to the ſouth, were taken in our ſhip; and ſailing at ſpring-time the contrary way, from the ſouth to the north, I obſerved them on their return when many of them were taken in the ſame manner." This account is confirmed by many others; who aver, that they chuſe a north wind for theſe adventures; the ſouth wind retarding their flight, by moiſtening their pulmage. They then fly two by two; and when their way lies over land, they make more ſpeed by night than by day. They alſo fly very high, to avoid being ſurpriſed or ſet upon by birds of prey. It is now, however, aſſerted by ſome, that the quail only migrates from one province of a country to another. For inſtance, that in England, they fly from the inland counties, to thoſe bordering on the ſea, and continue there all winter.

Theſe birds are much leſs prolific than the partridge; ſeldom laying more than ſix or ſeven whitiſh eggs, marked with ragged, ruſt-coloured ſpots. Quail-fighting was a favorite amuſement among the Athenians. They abſtained from the fleſh of this bird ſuppoſing that it fed upon the white hellebore. Notwithſtanding this, they reared great numbers of them, for the pleaſure of ſeeing them fight; and ſtaked ſums of money, as we do with regard to cocks, upon the ſucceſs of the combat. Faſhion, however, has at preſent changed with regard to this bird; we take no pleaſure in its courage, but its fleſh is conſidered as a very great delicacy.

CHAP. XXV.

OF BIRDS OF THE PIE SPECIES.—THE RAVEN.—THE CROW.—THE MAGPIE.—THE ROLLER.—THE TOUCAN.—THE WOODPECKER.—THE BIRD OF PARADISE.—THE CUCKOO.—THE PARROT, MACKAW, PAROKEET, &C.—THE PIGEON.

THE Raven, the Carrion-crow, and the Rook, are birds ſo well known, that a long deſcription would but obſcure our ideas of them. The raven is the largeſt of the three, and diſtinguiſhed from the reſt not only by his ſize, but by his bill which is ſomewhat more hooked than that of the reſt. As for the carrion-crow and the rook, they ſo ſtrongly reſemble each other, both in make and ſize, that they are not eaſily diſtinguiſhed when ſeparated. The chief difference to be found between them conſiſts in the bill of the rook; which, by frequently being thruſt into the ground to fetch out grubs and earth-worms, is without feathers as far as the eyes, and appears of a whitiſh colour. It differs alſo in the purple ſplendour or gloſs of its feathers, which in the carrion-crow are of a more dirty-black. Nor is it amiſs to make theſe diſtinctions, as the rook has but too frequently ſuffered for its ſimilitude to the carrion-crow. Hence a harmleſs bird, that feeds only upon inſects and corn, has been deſtroyed for another that feeds upon carrion, and is often deſtructive among young poultry.

The *raven* is a bird found in every region of the world; ſtrong and hardy, he is uninfluenced by the changes of the weather. Thus when other birds ſeem numbed with cold, or pining with famine, the raven is active and healthy, buſily employed in prowling for prey, or ſporting in the coldeſt atmoſphere. As the heats at the line do not oppreſs him, ſo he endures the cold of the polar countries with equal indifference. He is ſometimes indeed ſeen milk white, and this may probably be the effect of the rigorous climates of the north. A raven may be reclaimed to almoſt every purpoſe to which birds can be converted. He may be trained up for fowling like an hawk: he may be taught to fetch and carry like a ſpaniel: he may be taught to ſpeak like a parrot; but the moſt extraordinary of all is, that he can be taught to ſing like a man. I have heard a raven ſing the Black Joke with great diſtinctneſs, truth, and humour.

Indeed, when the raven is taken as a domeſtic, he has many qualities that render him extremely amuſing. Buſy, inquiſitive, and impudent, he goes every where, affronts and drives off the dogs, plays his pranks on the poultry, and is particularly aſſiduous in ingratiating himſelf with the cook maid. But then, with the amuſing qualities of a favourite, he often alſo has the vices and defects. He is a glutton by nature, and a thief by habit. He does not confine himſelf to petty depredations on the pantry or the larder: he ſoars at more magnificent plunder; at ſpoils which he can neither exhibit nor enjoy; but which, like a miſer, he reſts ſatisfied with having the ſatisfaction of ſometimes viſiting and contemplating in ſecret. A piece of money, a tea-ſpoon, or a ring, are always tempting baits to his avarice. Theſe he will ſlily ſeize upon, and, if not watched, will carry to his favourite hole.

In his wild ſtate, the raven is an active and greedy plunderer. Nothing comes amiſs to him. If in his flights he perceive no hopes of carrion, and his ſcent is ſo exquiſite, that he can ſmell it at a vaſt diſtance; he then contents himſelf with more unſavoury food, fruits, inſects, and the accidental deſert of a dunghill. This bird generally builds its neſt in trees, and lays five or ſix eggs of a pale green colour, marked with ſmall browniſh ſpots.

Notwithſtanding the injury theſe birds do in picking out the eyes of ſheep and lambs, when they find them ſick and helpleſs, a vulgar reſpect is paid them as being the birds that fed the prophet Elijah in the wilderneſs. This pre-poſſeſſion in favour of the raven is of very ancient date, as the Romans themſelves, who thought the bird ominous, paid it, from motives of fear, the moſt profound veneration. One of theſe that had been kept in the temple of Caſtor, as Pliny informs us, flew down into the ſhop of a taylor, who took much delight in the viſits of his new acquaintance. He taught the bird ſeveral tricks: but particularly to pronounce the name of the emperor Tiberius and the whole royal family. The taylor was beginning to grow rich by thoſe who came to ſee this wonderful raven, till an envious neighbour, killed the bird, and deprived the taylor of his future hopes of fortune. The Romans, however, took the poor taylor's part; they puniſhed the man who offered the injury, and conferred on the raven all the honours of a magnificent interment.

Birds in general live longer than quadrupeds; and the raven is ſaid to be one of the moſt long-lived of the number. Some of them have been known to live near an hundred years. This animal, indeed, ſeems poſſeſſed of thoſe qualities that generally produce longevity, a good appetite, and great exerciſe.

The *carrion-crow* reſembles the raven in its appetites, its laying, and manner of rearing its young. It only differs in being leſs bold, leſs docile, and leſs favoured by mankind.

The *rook* leads the way in another, but a more harmleſs train, that have no carnivorous appetites, but only feed upon inſects and corn. The Royſton crow is about the ſize of the two former. The breaſt, belly, back, and upper part of the neck, are of a pale aſh-colour: the head and wings are gloſſed over with a fine clue. He is a bird of paſſage, viſiting this kingdom in the beginning of winter, and leaving it in the ſpring. He breeds, however, in different parts of the Britiſh dominions; and his neſt is common enough in trees in Ireland. The jack-daw is black, like all the former, but aſh-coloured on the breaſt and belly. He is not above the ſize of a pigeon. He is docile and loquacious. His head is large for the ſize of his body, which, indicates him to be ingenious and crafty. The female builds in ſteeples, old caſtles, and high rocks, and lays five or ſix eggs in a ſeaſon. The Corniſh chough is like a jack daw, but larger, and almoſt the ſize of a crow. The feet and legs are long like thoſe of a jack-daw, but a red colour; and the plumage is wholly black. It frequents rocks, old caſtles, and churches, by the ſea-ſide, like the daw; and with the ſame noiſy aſſiduity. It is only ſeen along the weſtern coaſts of England. Theſe are birds very ſimilar in their manners, feeding on grain and inſects, living in ſociety, and often ſuffering general chaſtiſement from the flock for the good of the community.

To this tribe of the craw-kind, ſome foreign ſorts might be added. I will take notice only of one, which, from the extraordinary ſize and faſhion of its bill, muſt not be omitted. This is the *Calao*, or horned Indian raven, which exceeds the common raven in ſize, and habits of depredation. But what he differs in from all other birds, is the beak, which, by its length and curvature at the end, appears deſigned for rapine, but then it has a kind of horn ſtanding out from the top, which is ſomewhat like a ſecond bill, and gives this bird, otherwiſe fierce and deformed, a very formidable appearance. The horn ſprings out of the forehead, and grows to the upper part of the bill, being of great bulk; ſo that near the forehead it is four inches broad, not unlike the horn of the rhinoceros, but more crooked at the tip. In ſuch of thoſe birds as come from different parts of Africa, the body is proportionable to the beak. In ſuch however, as come from the Molucca Iſlands, the beak bears no proportion to the body.

The Magpie.

The Magpie is too well known to need any deſcription. Indeed, were its other accompliſhments equal to its beauty, few birds could be put in competition with it. Its black, its white, its green and purple, with the rich and gilded combination of the gloſſes on its tail, are as fine as any that adorn the moſt beautiful of the feathered tribe. But it has too many of the qualities of a beau, to depreciate theſe natural perfections. Vain, reſtleſs, loud, and quarrelſome, it is an unwelcome intruder every where; and never miſſes an opportunity to do miſchief.

The magpie bears a great reſemblance to the butcher-bird in its bill, which has a ſharp proceſs near the end of the upper chap, as well as in the ſhortneſs of its wings, and the form of the tail, each feather ſhortening from the two middlemoſt. But it agrees ſtill more in its food, living not only upon worms and inſects, but alſo upon ſmall birds, when they can be ſeized. A wounded lark, or a young chicken ſeparated from the hen, are ſure plunder; and the magpie will even ſometimes ſeize a black-bird.

The ſame inſolence prompts it to teaze the largeſt animals when its inſults can be offered with ſecurity. They often are ſeen perched upon the back of an ox or a ſheep, pecking up the inſects to be found there, chattering and tormenting the poor animal at the ſame time, and ſtretching out their necks for combat, if the beaſt turns its head againſt them. They ſeek out alſo the neſts of birds; and, if the dam eſcape, the eggs make up for the deficiency. The thruſh and the black bird are but too frequently robbed by this aſſaſſin, and this in ſome meaſure occaſions their ſcarcity.

No food ſeems to come amiſs to this bird; it ſhares with ravens in their carrion, with rooks in their grain, and with the cuckoo in the eggs of birds: but it ſeems poſſeſſed of a prudence ſeldom uſual with gluttons: for when it is ſatisfied for the preſent, it lays up the remainder of the feaſt for another occaſion. It will even in a tame ſtate hide its food, and after a time return to the ſecret hoard with renewed appetite and vociferation.

In all its habits it diſcovers a degree of inſtinct unuſual to other birds. Its neſt is not leſs remarkable for the place in which it is built. The neſt is uſually placed conſpicuous enough, either in the middle of ſome hawthorn buſh, or on the top of ſome high tree. The place, however, is always found difficult of acceſs; for the tree pitched upon uſually grows in ſome thick hedge-row, fenced by brambles at the root; or ſometimes one of the higher buſhes is fixed upon for the purpoſe. When the place is thus choſen as inacceſſible as poſſible to men, the next care is to fence the neſt above. The kite, the crow, and the ſparrow-hawk, are to be guarded againſt; as their neſts have been ſometimes plundered by the magpie, ſo it may be naturally thought that they will take the firſt opportunity to retaliate. To prevent this, the magpie's neſt is built with ſurpriſing labour and ingenuity.

The body of the neſt is compoſed of hawthorn branches; and thorns ſticking outward, but well united together by their mutual inſertions. Within it is lined with fibrous roots, wool, and long graſs, and then nicely plaiſtered all round with mud and clay. The body of the neſt being thus made firm and commodious, the next work is to make the canopy which is to defend it above. This is compoſed of the ſharpeſt thorns, interwoven in ſuch a manner as to deny all entrance except at the door, which is juſt large enough to permit the owners to go in and out. In this fortreſs the male and female hatch and bring up their brood with ſecurity, ſheltered from all attacks but thoſe of the climbing ſchool-boy, who often finds his torn and bloody hands too dear a price for the eggs or the young ones. The magpie lays ſix or ſeven eggs, of a pale green colour, ſpotted with brown.

This bird, in its domeſtic ſtate, preſerves its natural character with ſtrict propriety. The ſame noiſy, miſchievous habits attend it to the cage that marked it in the woods; and being more cunning, ſo it is alſo a more docile bird than any other. Thoſe who are deſirous of teaching it to ſpeak, have a fooliſh cuſtom of cutting its tongue, which only puts the poor animal to pain, without improving its ſpeech in the leaſt. Its ſpeaking is ſometimes very diſtinct; but its ſounds are too thin and ſharp to be an exact imitation of the human voice, which the hoarſe raven and parrot can counterfeit more exactly.

The Jay.

To this tribe we may refer the jay, which is one of the moſt beautiful of the Britiſh birds. The forehead is white, ſtreaked with black; the head is covered with very long feathers, which it can erect into a creſt at pleaſure. The whole neck, back, breaſt, and belly, are of a faint purple, daſhed with grey. The wings are moſt exquiſitely barred with a beautiful blue, black, and white. The tail is black, and the feet are of a pale brown. Like the magpie, it feeds upon fruits, will kill ſmall birds, and is extremely docile.

The Chatterer.

The chatterer alſo, which is a native of Germany, may be ranked in this claſs; and is ſomewhat leſs than the former. It is variegated with a mixture of colours; red, aſh colour, cheſnut, and yellow.

The Roller.

The roller is not leſs beautiful than any of the former. Its breaſt and belly are blue: its head is green; and the wings are variegated with blue, black, and white. But it may be diſtinguiſhed from all others by a ſort of naked tubercles or warts near the eyes, which contribute to increaſe its beauty.

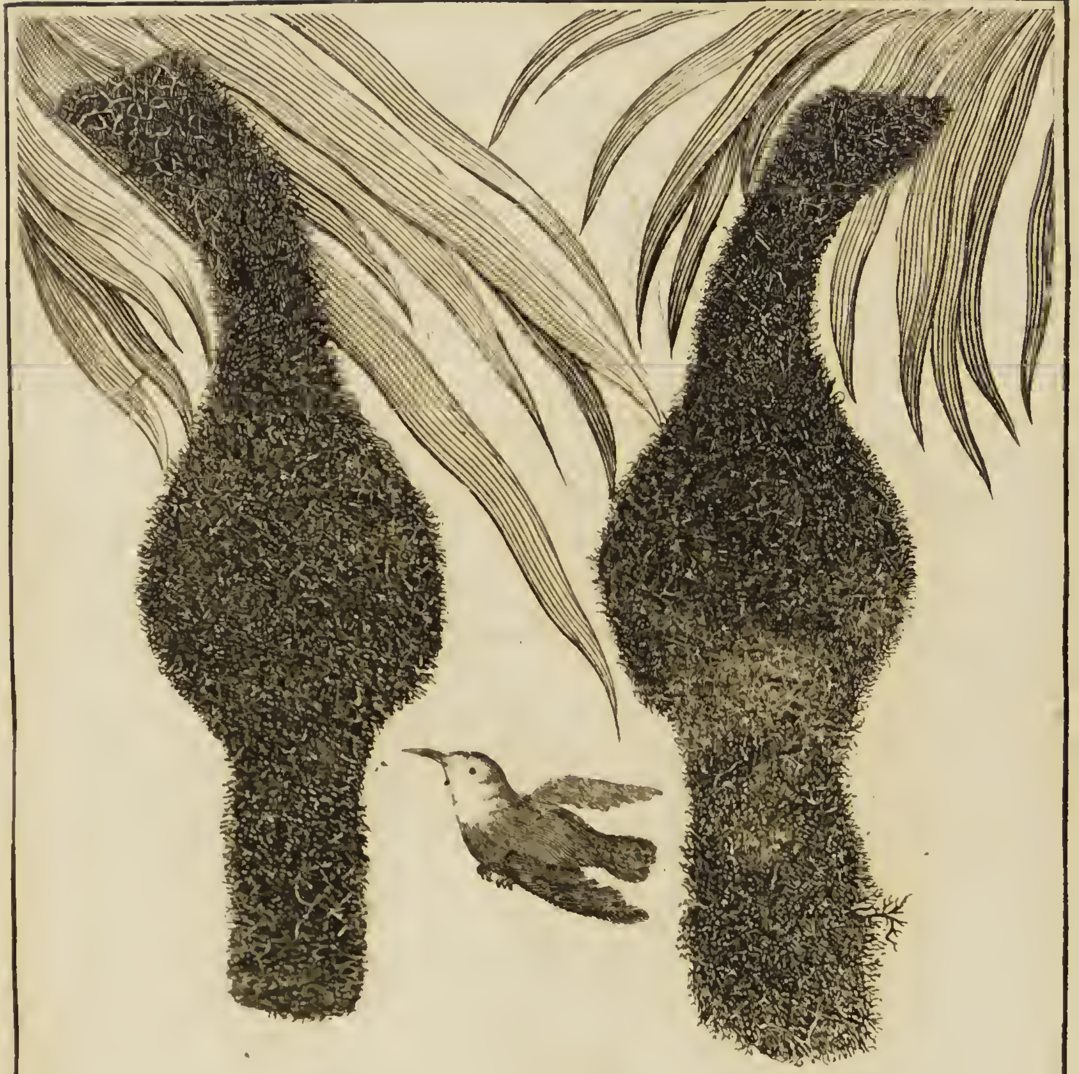
To this claſs may be added a numerous liſt from all the tropical foreſts of the eaſt and weſt. I will fix only upon one, the *Toucan*, a bird of the pie kind, whoſe bill is nearly as large as the reſt of its whole body.

Of this extraordinary bird there are four or five varieties. I ſhall only deſcribe the red-beaked toucan. It is about the ſize of, and ſhaped like a jack-daw, with a large head to ſupport its monſtrous bill. This bill, from the angles of the mouth to its point, is ſix inches and an half; and its breadth, in the thickeſt part, is a little above two. Its thickneſs near the head, is one inch and a quarter; and it is a little rounded along the top of the upper chap, the under ſide being round alſo. The whole of the bill is extremely ſlight, and a little thicker than parchment. The upper chap is of a bright yellow, except on each ſide, which is of a fine ſcarlet colour; as is alſo the lower chap, except at the baſe which is purple. Between the head and the bill there is a black line of ſeparation all round the baſe of the bill. In the upper part of this bill the noſtrils are placed, and are almoſt covered with feathers; which has made ſome writers to ſay, that the toucan has no noſtrils. Round the eyes, on each ſide of the head, is a ſpace of bluiſh ſkin, without feathers, above which the head is black, except a white ſpot on each joining to the baſe of the upper chap. The hinder part of the neck, the back, wings, tail, belly, and thighs, are black. The under ſide of the head, throat, and the beginning of the breaſt, are white. Between the white on the breaſt, and the black on the belly, is a ſpace of red feathers, in the form of a new moon, with its horns upwards. The legs, feet and claws, are of an aſh-colour; and the toes ſtand like theſe of parrots, two before, and two behind.

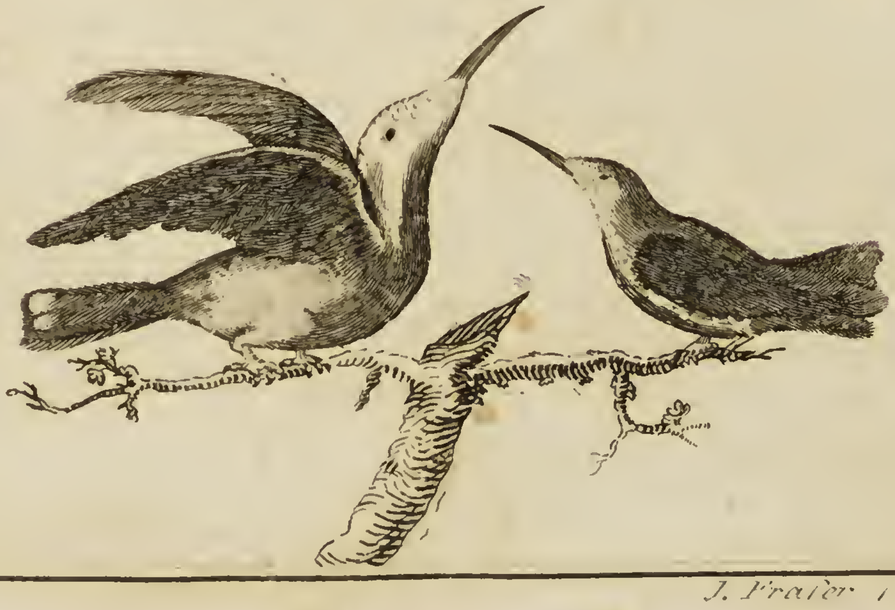
It is reported, by travellers, that this bird, though furniſhed with ſo formidable a beak, is harmleſs and gentle, being ſo eaſily tamed, as to ſit and hatch its young in houſes. It feeds chiefly upon pepper, which it devours very greedily, gorging itſelf in ſuch a manner, that it voids it crude and unconcocted. This, however, is no objection to the natives from uſing it again. They even prefer it before that pepper which is freſh gathered from the tree; and ſeem perſuaded that the ſtrength and heat of the pepper is qualified by the bird, and that all its noxious qualities are thus exhauſted.

This bird is only found in the warm climates of South America, where it is highly prized, both for the delicacy of its fleſh, which is tender and nouriſhing, and for the beauty of its plumage, particularly

Plate 27.



Tropical Birds of the Woodpecker Species &
their manner of building their Neſts.



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the feathers of the breaſt. The ſkin of this part the Indians pluck off, and when dry, glue it to their cheeks; and conſider it as an irreſiſtible addition to their beauty.

The Woodpeckers.

Theſe birds live chiefly upon the inſects contained in trees; and for this purpoſe they are furniſhed with a ſtraight, hard, ſtrong, angular and ſharp bill, made for piercing and boring. They have a tongue of a very great length; round, ending in a ſharp, ſtiff, bony thorn, dentated on each ſide, to ſtrike ants and inſects when diſlodged from their cells. Their legs are ſhort and ſtrong, for the purpoſes of climbing. Their toes ſtand two forward, and two backward; which is particularly ſerviceable in holding by branches of trees. They have hard ſtiff tails, to lean upon when climbing. They feed only upon inſects, and want that inteſtine, which anatomiſts call the cecum; a circumſtance peculiar to this tribe.

Of this bird there are many kinds, and many varieties in each kind. They form large colonies in the foreſts of every part of the world. They differ in ſize, colour, and appearance; and agree only in the marks above-mentioned, or in thoſe habits which reſult from ſo peculiar a conformation. Inſtead, therefore, of deſcending into a minute diſcrimination of every ſpecies, let us take one for a pattern. The Green Wood-ſpite or Wood-pecker is called the Rain Fowl in ſome parts of the country; becauſe, when it makes a greater noiſe than ordinary, it is ſuppoſed to foretell rain. It is about the ſize of a jay; the throat, breaſt and belly are of a pale greeniſh colour; and the back, neck and covert feathers of the wings are green. But the tongue makes its moſt diſtinguiſhed characteriſtic, as it ſerves for its ſupport and defence. As was ſaid above, the wood-pecker feeds upon inſects; and particularly on thoſe which are lodged in the body of hollow or of rotting trees. The tongue is its inſtrument for killing and procuring this food; which cannot be found in great plenty. This is round, ending in a ſtiff, ſharp, bony tip, dentated on both ſides, like the beard of an arrow; and this it can dart out three or four inches from the bill, and draw in again at pleaſure. Its prey is thus transfixed, and drawn into the bill, which, when ſwallowed, the dart is again launched at freſh game.

The wood-pecker, however, does not confine its depredations ſolely to trees, but ſometimes lights upon the ground, to try its fortune at an ant-hill. The wood-pecker firſt goes to their hills, which it pecks, in order to call them abroad; it then thruſts out its long red tongue, which being like a worm, and reſembling their uſual prey, the ants crowd out to ſettle upon it. However, the bird watching the propereſt opportunity, withdraws its tongue at a jerk, and devours the devourers. This ſtratagem is continued till it has alarmed their fears; or till it is quite ſatisfied.

As the wood pecker is obliged to make holes in trees to procure food, ſo is it alſo to make cavities ſtill larger to form its neſt and to lay in. This is performed, as uſual, with the bill; although ſome have affirmed that the animal uſes its tongue, as a gimblet, to bore with. But this is a miſtake; and thoſe that are curious, may often hear the noiſe of the bill making its way in large woods and foreſts. The wood-pecker chuſes, however, for this purpoſe, trees that are decayed, or wood that is ſoft, like beech, elm and poplar. In theſe, with very little trouble, it can make holes as round as a mathematician could do with compaſſes. One of theſe holes the bird generally chuſes for its own uſe, to neſtle, and bring up its young in. As they are eaſily made, it is delicace in its choice, and often makes twenty before one is found fit to give entire ſatisfaction.

The wood-pecker takes no care to line its neſt with feathers or ſtraw; its eggs are depoſited in the hole, without any thing to keep them warm, except the heat of the body of the dam. Their number is generally five or ſix; always white, oblong, and of a middle ſize. When the young are excluded, and before they leave the neſt, they are adorned with a ſcarlet plumage under the throat, which adds to their beauty.

In Guinea and Braſil, the birds of this ſpecies take a different method to protect and hatch their progeny. A traveller who walks into the foreſts of thoſe countries, among the firſt objects that excite curioſity, is ſtruck with the multitude of birds neſts hanging at the extremity of almoſt every branch. Many other kind of birds build in this manner; but the chief of them are of the wood-pecker kind. In cultivated countries, a great part of the caution of the feathered tribe is to hide or defend their neſts from the invaſions of man, as he is their moſt dreaded enemy. But in the depth of thoſe remote and ſolitary foreſts, where man is but ſeldom ſeen, if the monkey or the ſnake can be eluded, the bird has no other enemy to fear. On the bananas and plantanes of theſe regions, is ſeen the moſt various, and the moſt hoſtile aſſemblage of creatures that can be imagined. The top is inhabited by monkies of ſome particular tribe, that drive off all others. Lower down about the great trunk numbers of the larger ſnakes are found patiently waiting till ſome unwary animal comes within the ſphere of their activity; and at the edges of the tree hang theſe artificial neſts, in great abundance, inhabited by birds of the moſt beautiful plumage.

The neſt is uſually formed in this manner. When the time of incubation approaches, they fly buſily about, in queſt of a kind of moſs, called, by the Engliſh inhabitants of thoſe countries, *old man's beard*. It is a fibrous ſubſtance, and not very unlike hair, which bears being moulded into any form, and ſuffers being glued together. This, therefore, the little wood-pecker, called by the natives of Braſil, the Guiratemga, firſt glues by ſome viſcous ſubſtance, gathered in the foreſt, to the extremeſt branch of a tree. Then building downward, and ſtill adding freſh materials to thoſe already procured, a neſt is formed, that depends, like a pouch, from the point of the branch. The hole to enter at, is on the ſide; and all the interior parts are lined with the finer fibres of the ſame ſubſtance, which compoſe the whole.

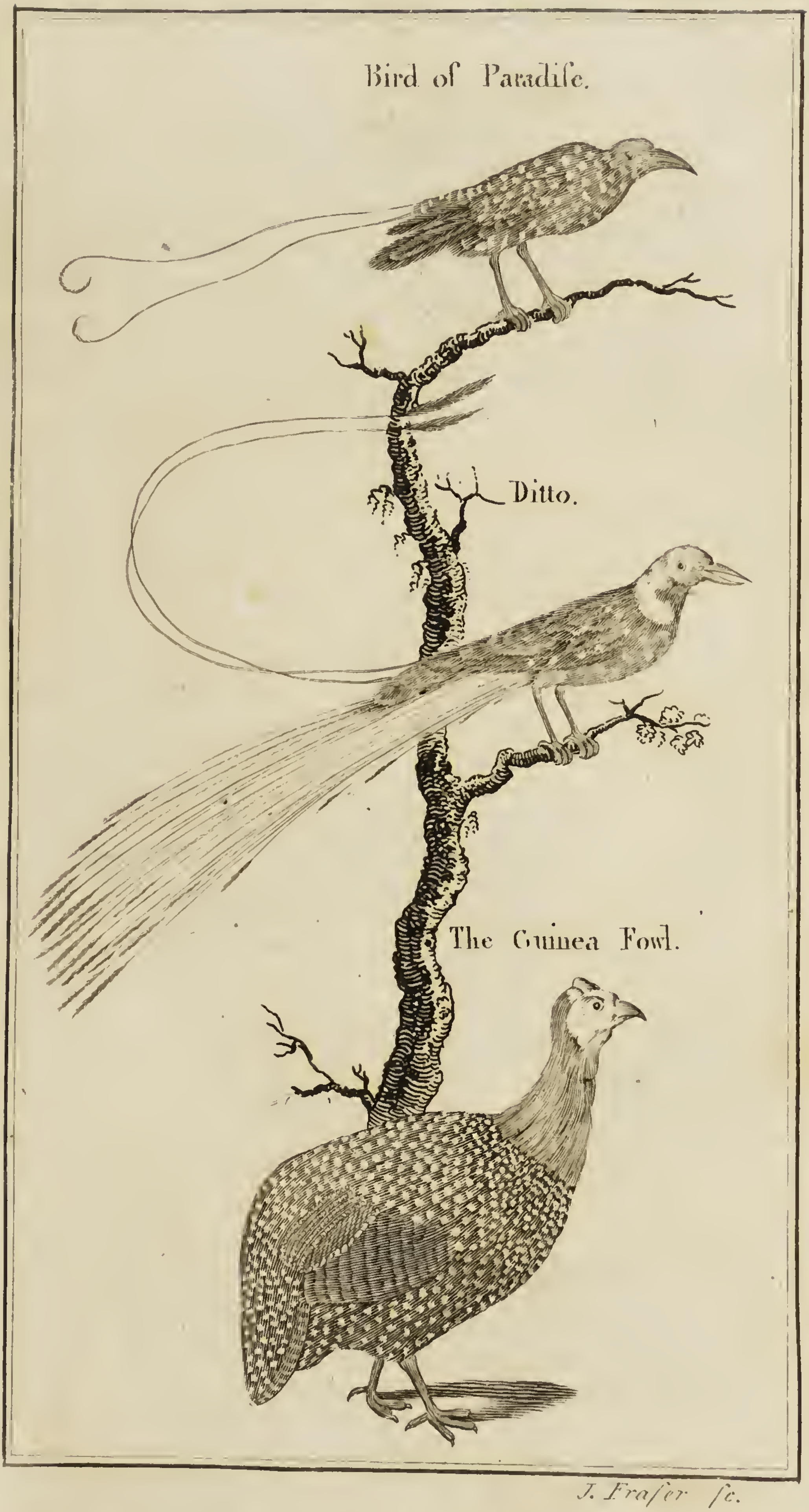
Such is the general contrivance of theſe hanging neſts; which are made, by ſome other birds, with ſtill greater art. A little bird of the Groſbeak kind, in the Philippine iſlands, makes its neſt in ſuch a manner, that there is no opening but from the bottom. At the bottom the bird enters, and goes up through a funnel, like a chimney, till it comes to the real door of the neſt, which lies on one ſide, and only opens into this funnel.

Of the Bird of Paradiſe.

There are two kinds of the Bird of Paradiſe; one about the ſize of a pigeon, which is more common; the other not much larger than a lark, which has been deſcribed more perfectly.

The

Plate 25.


Bird of Paradiſe.
Ditto.
The Guinea Fowl.

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The larger of theſe birds appears to be nearly as big as a pigeon, though in reality the body is not much bigger than that of a thruſh. Its tail, which is about ſix inches, is as long as its body; and its wings are large in proportion to its other dimenſions. The head, the throat and the neck are of a pale gold colour. The baſe of the bill is ſurrounded by black feathers, as is alſo the ſide of the head and throat, as ſoft as velvet, and changeable like thoſe on the neck of a mallard. The hinder part of the head is of a ſhining green, mixed with gold. The body and wings are chiefly covered with beautiful brown, purple and gold feathers. The uppermoſt part of the tail feathers are of a pale yellow, and thoſe under them white and longer than the former; for which reaſon the hinder part of the tail appears to be entirely white. But what chiefly excites curioſity are, two long naked feathers, which ſpring from the upper part of the rump above the tail, and which are for the moſt part about three feet long. Theſe are bearded only at the beginning and the end; the whole ſhaft for above two feet nine inches being of a deep black, while the feathered extremity is of a changeable colour, like the mallard's neck.

Theſe birds, which for beauty exceeds all others of the pie kind, are natives of the Molucca Iſlands, but found in greateſt numbers in that of Aro. The inhabitants are not inſenſible of the pleaſure they afford, and give them the name of God's birds as being ſuperior to all others that he has made. They live in large flocks, and at night generally perch upon the ſame tree. They are called by ſome, the Swallows of Ternate, from their rapid flight, and from their being continually on the wing in purſuit of inſects, their uſual prey.

As the country where they are bred has its tempeſtuous ſeaſon, when rains and thunders continually diſturb the atmoſphere, theſe birds are then but ſeldom ſeen. The natives, who make a trade of killing and ſelling them to the Europeans, generally conceal themſelves in the trees whither they reſort, and having covered themſelves up from ſight in a bower made of the branches, they ſhoot at the birds with reedy arrows. And they aſſert, if they happen to kill the king, they then have a good chance to kill the greateſt part of the flock. The chief mark by which they know the king is by the ends of the feathers in his tail, which have eyes like thoſe of a peacock. When they have taken a number of theſe birds, their uſual method is to gut them and cut off their legs. They then run a hot iron into the body, which dries up the internal moiſture; and filling the cavity with ſalts and ſpices, they ſell them to the Europeans for a perfect trifle.

The Cuckoo.

This ſingular bird, which is ſomewhat leſs than a pigeon, ſhaped like a magpie, and of a greyiſh colour, is diſtinguiſhed from all other birds, by its round prominent noſtrils. Having diſappeared all the winter, it diſcovers itſelf in our country early in the ſpring, by its well known call. Its note is heard earlier or later as the ſeaſon ſeems to be more or leſs forward, and the weather more or leſs inviting. From the cheerful voice of this bird the farmer may be inſtructed in the real advancement of the year. His note is pleaſant though uniform; and, from an aſſociation of ideas, ſeldom occurs to the memory without reminding us of the ſweets of ſummer.

The female cuckoo makes no neſt of her own. She repairs for that purpoſe to the neſt of ſome other bird, generally the water-wagtail or hedge-ſparrow, and having devoured the eggs of the owner, ſubſtitutes her own in their place. She uſually lays but one, which is ſpeckled, and of the ſize of a blackbird's. This the fond fooliſh bird hatches with great aſſiduity, and, when excluded, finds no difference in the great ill-looking changeling from her own. To ſatisfy the appetite of this voracious creature, the credulous nurſe toils with unuſual care, no way ſenſible that ſhe is rearing an enemy to her race, and one of the moſt deſtructive robbers of her future progeny.

It was once doubted, whether theſe birds were carnivorous; but Reaumur was at the pains of breeding up ſeveral, and found that they would not feed upon bread or corn; for fleſh and inſects were their favourite nouriſhment. Their gluttony is not to be wondered at, when we conſider the capacity of their ſtomach, which is enormous, and reaches from the breaſt-bone to the vent.

The cuckoo when fledged follows its ſuppoſed dam but for a little time. Its appetites for inſect food increaſe, and as it finds no great chance for a ſupply in imitating its little inſtructor, it parts good friends, the ſtep-child ſeldom offering any violence to its nurſe. Nevertheleſs, all the little birds of the grove ſeem to conſider the young cuckoo as an enemy, and revenge the cauſe of their kind by their repeated inſults. They purſue it wherever it flies, and oblige it to take ſhelter in the thickeſt branches of ſome neighbouring tree. All the ſmaller birds form the train of its purſuers; but the wry-neck, in particular, is found the moſt active in the chaſe. Hence it has been called by many the cuckoo's attendant and provider. But it is very far from following with a friendly intention: it only purſues as an inſulter, or a ſpy, to warn all its little companions of the cuckoo's depredations.

Such are the manners of this bird whilſt it continues to reſide, or to be ſeen amongſt us. But early, at the approach of winter, it totally diſappears, and its paſſage can be traced to no other country. Some ſuppoſe that it lies hid in hollow trees; and others that it paſſes into warmer climates. Which of theſe opinions is beſt founded is very uncertain, as there are no facts related on either ſide that can be totally depended on. To ſupport the opinion that they remain torpid during the winter, at home, Willoughby introduces the following ſtory, which he delivers upon the credit of another. "The ſervants of a gentleman, in the country, having ſtocked up, in one of their meadows, ſome old dry rotten willows, thought proper on a certain occaſion, to carry them home. In heating a ſtove, two logs of this timber were put into the furnace beneath, and fire applied as uſual. But ſoon, to the great ſurprize of the family, was heard the voice of a cuckoo, ſinging three times from under the ſtove. Wondering at ſo extraordinary a cry in winter time, the ſervants ran and drew the willow logs from the furnace, and in the midſt, one of them ſaw ſomething move: wherefore, taking an ax, they opened the hole, and thruſting in their hands, firſt they plucked out nothing but feathers; afterwards they got hold of a living animal; and this was the cuckoo that had waked ſo very opportunely for its own ſafety. It was, indeed," continues our hiſtorian, "briſk and lively, but wholly naked and bare of feathers, and without any winter proviſion in its hole. This cuckoo the boys kept for years afterwards alive in the ſtove; but whether it repaid them with a ſecond ſong, the author of the tale has not thought fit to inform us."

The moſt probable opinion on this ſubject is, that as quails and woodcocks ſhift their habitations in winter, ſo alſo does the cuckoo. But to what country it retires, or whether it has been ever ſeen on its journey, are queſtions that I am wholly incapable to anſwer.

Of this bird there are many kinds in various parts of the world, not only differing in their colours but alſo in their ſize. Briſſon makes not leſs than twenty-eight ſorts of them; but what analogy they bear to our Engliſh cuckoo I will not take upon me to determine.

The Parrot.

The Parrot is the beſt known among us of all foreign birds, as it unites the greateſt beauty with the greateſt docility.

The eaſe with which this bird is taught to ſpeak, and the great number of words which it is capable of repeating, are no leſs ſurpriſing. We are aſſured, by a grave writer, that one of theſe was taught to repeat a whole ſonnet from Petrarch; and I myſelf, have ſeen a parrot, belonging to a diſtiller, who had ſuffered pretty largely in his circumſtances from an informer who lived oppoſite him, very ridiculouſly employed. This bird was taught to pronounce the ninth commandment, *Thou ſhalt not bear falſe witneſs againſt thy neighbour*, with a very clear, loud, articulate voice. The bird was generally placed in its cage over againſt the informer's houſe, and delighted the whole neighbourhood with its perſevering exhortations.

Willoughby tells the following ſtory of a parrot. "A parrot belonging to king Henry the Seventh, who then reſided at Weſtminſter, in his palace by the river Thames, had learned many words from the paſſengers as they happened to take water. One day, ſporting on its perch, the poor bird fell into the water, at the ſame time crying out, as loud as he could, *A boat, twenty pound for a boat.* A waterman, who happened to be near, hearing the cry, made to the place where the parrot was floating, and taking him up, reſtored him to the king. As it ſeems the bird was a favourite, the man inſiſted that, as the parrot had cried twenty pounds, the king was bound in honour to grant it. The king at laſt agreed to leave it to the parrot's own determination, which the bird hearing, cried out, *Give the knave a groat.*"

Thoſe who uſually bring theſe birds over are content to make three or four diſtinctions. The large kind, which are of the ſize of a raven, are called Maccaws. The next ſize are ſimply called Parrots. Thoſe which are entirely white are called Lories; and thoſe of the leaſt ſize are called Parakeets. The difference between even theſe is rather in the ſize than in any other peculiar conformation, as they are all formed alike, having toes two before and two behind for climbing and holding. They have alſo ſtrong hooked bills for breaking open nuts, and other hard ſubſtances, on which they feed; loud harſh voices, by which they fill their native woods with clamour.

The bill is faſhioned with peculiarities; for the upper chap, as well as the lower, are both moveable. In moſt other birds the upper chap is connected, and makes but one piece with the ſkull; but in theſe, and in one or two ſpecies of the feathered tribe more, the upper chap is connected to the bone of the head by a ſtrong membrane, placed on each ſide, that lifts and depreſſes it at pleaſure. By this they can open their bills the wider; which is not a little uſeful, as the upper chap is ſo hooked and ſo over-hanging, that, if the lower chap only had motion, they could ſcarcely take any food.

The tongue of this bird ſomewhat reſembles that of a man. Hence ſome pretend that it is ſo well qualified to imitate the human voice; but the organs by which theſe ſounds are articulated lie farther down in the throat, being performed by the great motion which the os hyoides has in theſe birds above others.

The parrot, though common enough in Europe, will not, however, breed here. The climate is too cold for its warm conſtitution; and though it endures our winter when arrived at maturity, yet it always ſeems ſenſible of its rigour, and loſes both its ſpirit and appetite during the colder part of the ſeaſon.

This ſagacity, which parrots ſhew in a domeſtic ſtate, ſeems alſo natural to them in their native reſidence, the woods. They live together in flocks, and mutually aſſiſt each other againſt other animals, either by their courage or their notes of warning. They generally breed in hollow trees, where they make a round hole, and do not line their neſt within. If they find any part of a tree beginning to rot from the breaking off of a branch, or any ſuch accident, they take care to ſcoop it, and to make the hole ſufficiently wide and convenient. Notwithſtanding this, it ſometimes happens that they are content with the hole which a wood-pecker has wrought out with greater eaſe before them; and in it they prepare to hatch and bring up their young.

They lay two or three eggs; and probably the ſmaller kind may lay more; for it is a general law of nature, that the ſmalleſt animals are always the moſt prolific.

It is not for the ſake of their converſation alone that the parrot is ſought after among the ſavages; for, though ſome of them are but tough and ill-taſted, yet there are other ſorts, particularly of the ſmall parakeet tribe, that are very delicate food. The ſeed of the cotton-tree intoxicates them as wine intoxicates man. Even wine itſelf is drunk by parrots too, which renders them more talkative and amuſing. But of all food, they are fondeſt of the carthamus, or baſtard ſaffron; which, though ſtrongly purgative to man, agrees perfectly with their conſtitution, and fattens them in a very ſhort time.

The parakeet kind in Braſil are moſt beautiful in their plumage, and are the moſt talkative birds in nature. They are very tame, and appear fond of mankind. And while he continues to talk, they anſwer him, and appear reſolved to have the laſt word. The fowler walks into the woods, where they abound; but as they are green, and exactly the colour of the leaves among which they ſit, he only hears their prattle, without being able to ſee a ſingle bird: he gazes round him, certain that his game is within gun-ſhot in abundance, but is mortified that it is impoſſible to ſee them. Unfortunately for theſe, however, as ſoon as they have ſtriped the tree on which they perched of all its berries, ſome one of them flies off to another; and, if that be found fit for the purpoſe, it calls upon the reſt. The fowler waiting this opportunity, fires in among the flock while they are yet on the wing; and he ſeldom fails of bringing down a part of them. But it is affecting enough to ſee them when they find their companions fall. They ſet up a loud outcry, as if they were chiding their deſtroyer, and do not ceaſe till they ſee him almoſt ready for a ſecond charge.

The tame pigeon.

The tame pigeon, and all its beautiful varieties, derive their origin from one ſpecies, to wit, the ſtock dove, a name which implies it being the ſtock or ſtem whence the other domeſtic kinds have been propagated. This bird, in its natural ſtate, is of a deep bluiſh aſh-colour; the breaſt is daſhed with a fine changeable green and purple: its wings are marked with two black bars; and its tail barred near the end with black. Theſe are the colours of the pigeon in a ſtate of nature; and from theſe ſimple tints has man by art propagated a variety that words cannot deſcribe, nor even fancy ſuggeſt. However, nature ſtill perſeveres in her great outline; and though the form, colour, and even the fecundity of theſe birds may be altered by art, yet their natural manners and inclinations continue ſtill the ſame.

The dove-houſe pigeon, as is well known, breeds every month; it lays two white eggs, which almoſt always produce young ones of different ſexes. From three or four o'clock in the evening, till nine next day, the female ſits on the eggs. The male then takes his place from ten till three, while his mate is feeding abroad. In this manner they ſit alternately till the young are excluded. If, during this term, the female delay to return at the expected time, the male follows and drives her to the neſt; and, ſhould he in his turn be dilatory, ſhe retaliates with equal ſeverity.

The young ones when hatched require no food for the three firſt days. They only need to be kept warm, which is an employment the female takes intirely upon herſelf. During this period, ſhe never ſtirs out, except a few minutes to take a little food. From this they are fed for eight or ten days, with corn or grain of different kinds, which the old ones gather in the fields, and treaſure up in their crops, whence they throw it up again into the mouths of their young ones, who very greedily demand it.

So prolific are theſe birds in their domeſtic ſtate, that near fifteen thouſand may in the ſpace of four years be produced from a ſingle pair. Thoſe pigeons which are uſed to convey letters, are eaſily diſtinguiſhed from all others by their eyes, which are compaſſed about with a broad circle of naked white ſkin, and by being of a dark blue or blackiſh colour. It is from their attachment to their native place, and particularly to the ſpot where they have reared their young, that theſe birds are employed in ſeveral countries as the moſt expeditious carriers. They are firſt brought from the place where they were bred, and whither it is intended to ſend them back with information. The letter is tied under the bird's wing, and it is then let looſe to return. The little animal no ſooner finds itſelf at liberty, than its paſſion for its native ſpot directs all its motions. It is ſeen, upon theſe occaſions, to fly to an amazing height; and then, with the greateſt certainty and exactneſs, to direct itſelf by ſome ſurprizing inſtinct towards home, which is ſometimes far off. In the ſpace of an hour and a half they perform a journey of forty miles; which is a degree of diſpatch three times greater than the fleeteſt quadruped can perform.

The varieties of the tame pigeon are ſo numerous, that it would be a vain attempt to mention them. So much is the figure and the colour of this bird under human controul, that pigeon-fanciers, by coupling a male and female of different ſorts, can breed them, as they expreſs it, to a feather. Hence we have the various names of croppers, carriers, jacobines, powters, runts, and turbits, &c. There are many ſpecies of the wild pigeon differing from the ſtock dove. The ring-dove is of this number; and is a good deal larger than the former. This bird appears to be far fonder of its native freedom than the ſtock-dove, and fruitleſs attempts have often been made to render it domeſtic. Averſe to confinement as ſoon as it can fly it betakes itſelf to its native woods.

The turtle-dove is a ſmaller, but a much ſhyer bird than any of the former. It may eaſily be diſtinguiſhed from the reſt by the iris of the eye, which is of a fine yellow, and by a beautiful crimſon circle that encompaſſes the eye-lids. The fidelity of theſe birds is noted; and a pair being put in a cage, if one dies the other will not ſurvive it. The turtle dove is a bird of paſſage, and few or none remain in our northern climates in winter. They fly in flocks when they come to breed here in ſummer, and delight in open, mountainous, ſandy countries. They build their neſts, however, in the midſt of woods.

CHAP. XXVI.

OF BIRDS OF THE SPARROW KIND.—OF THE THRUSH AND ITS AFFINITIES.—THE BLACK-BIRD.—THE FIELD-FARE, RED-WING AND STARLING.—THE MOCK-BIRD.—OF THE NIGHTINGALE, AND OTHER SOFT-BILLED SINGING BIRDS.—THE RED-BREAST.—THE LARK.—THE BLACK CAP AND WREN.—OF CANARY BIRDS, AND OTHER HARD-BILLED SINGING BIRDS.—THE LINNET, GOLDFINCH, &C.—OF THE SWALLOW, THE MARTIN, THE GOAT-SUCKER.—THE HUMMING-BIRD.

WITH the THRUSH we may rank the red-wing, the field-fare, the black-bird, the ring-ouzel, and the water-ouzel.

The Miſſel thruſh.

The Miſſel thruſh is diſtinguiſhed from all of the kind by being much larger than any of them. It differs ſcarcely in any other reſpect from the throſtle, except that the ſpots on the breaſt are larger. It builds its neſt in buſhes, or on the ſide of ſome tree, as all of this kind are found to do, and lays four or five eggs in a ſeaſon. Its ſong is very fine, which it begins in ſpring, ſitting on the ſummit of a high tree. It is the largeſt bird of all the feathered tribe that has muſic in its voice; the note of all greater birds being either ſcreaming, chattering, or croaking. It feeds on inſects, holly and miſletoe-berries; and ſometimes emits a very diſagreeable ſcream when frighted or diſturbed.

The Black-bird.

The Black-bird, which in old countries, and particularly upon the Alps, is ſometimes ſeen white, is, when heard at a diſtance, the moſt pleaſing ſongſter of the grove. It is the deepeſt toned warbler of the woods; but it is rather unpleaſant in a cage, being loud and deafening. It lays four or five blueiſh eggs, in a neſt uſually built at the ſtump of ſome old hawthorn, well plaiſtered on the inſide with clay, ſtraw, and hair.

Pleaſing, however, as this bird may be, the blue-bird, deſcribed by Bellonius, is in every reſpect far ſuperior. This beautiful creature entirely reſembles a black bird in all but its blue colour. It inhabits the higheſt parts of the Alps, and even there prefers the moſt craggy rocks and the moſt frightful precipices for it reſidence. As it is rarely caught, it is in high eſtimation even in the countries where it breeds, but it is ſtill more valuable when carried from home. It not only whiſtles in the moſt delightful manner, but ſpeaks with an articulate diſtinct voice. It is ſo docile, that, though waked at midnight by any of the family, it will ſpeak and whiſtle at the word of command. Its colour, about the beginning of winter, from blue becomes black, which changes to its original hue on the approach of ſpring.

The Field-fare and the Red-wing.

The Field-fare and the Red-wing make but a ſhort ſtay in this country. With us they are inſipid, tuneleſs birds, flying in flocks, and exceſſively watchful to preſerve the general ſafety. All their ſeaſon of muſic and pleaſure is employed in the more northern climates, where they ſing moſt delightfully, perched among the foreſts of mapples, with which thoſe countries abound. They build their neſts in hedges; and lay ſix blueiſh green eggs ſpotted with black.

The Stare or Starling.

The Stare or Starling, diſtinguiſhable from the reſt of this tribe by the gloſſy green of its feathers, in ſome lights, and the purple in others, breeds in hollow trees, caves of houſes, towers, ruins, cliffs, and often in high rocks over the ſea. It lays four or five eggs of a pale greeniſh aſh-colour, and makes its neſt of ſtraw, ſmall fibres of roots, &c. Its voice is rougher than the reſt of this kind; but what it wants in the melody of its note, it compenſates by the facility with which it is taught to ſpeak. In winter theſe birds aſſemble in vaſt flocks, and feed upon worms and inſects. At the approach of ſpring, they aſſemble in fields, as if to conſult about ſome matter of importance, and for three or four days ſeem to take no food. The greater part leave the country; the reſt breed here, and rear their young.

To this tribe might be added above an hundred other birds of nearly the thruſh ſize, and living like them upon fruits and berries. Words could not afford variety enough to deſcribe all the beautiful tints that adorn the foreign birds of the thruſh kind. The brilliant green of the emerald, the flaming red of the ruby, the purple of the amethyſt, or the bright blue of the ſapphire, could not by the moſt artful combination exhibit any thing ſo truly lively or delightful to the ſight as the feathers of the chilcoqui or the tautool. Without dwelling, therefore, upon theſe beautiful, but little known, birds, I will only mention the American MOCK-BIRD. It is but a plain bird to the eye, about the ſize of a thruſh, of a white and grey colour, and a reddiſh bill. It is poſſeſſed not only of its own natural notes, which are muſical and ſolemn, but it can aſſume the tone of every other animal in the wood, from the wolf to the raven. It ſeems even to amuſe itſelf in leading them aſtray. It will at one time allure the leſſer birds with the call of their males, and then terrify them when they have come near with the ſcreams of the eagle. The mock-bird, however, pleaſes moſt when it is alone. At thoſe times it uſually frequents the houſes of the American planters; and, ſitting all night on the chimney-top, pours forth the ſweeteſt and the moſt various notes of any bird whatever. It would ſeem, if accounts be true, that the deficiency of moſt other ſong-birds in that country is made up by this bird alone. They often build their neſts in the fruit-trees about houſes, and are eaſily rendered domeſtic.

The Nightingale.

The Nightingale is not only famous among the moderns for its ſinging, but almoſt every one of the ancients who undertook to deſcribe nature embelliſhed, has contributed to raiſe its reputation.

This moſt famous of the feathered tribe viſits England in the beginning of April, and leaves us in Auguſt. It is found but in ſome of the ſouthern parts of that country, being totally unknown in Scotland, Ireland, or North Wales. They frequent thick hedges and low coppices, and generally keep in the middle of the buſh, ſo that they are rarely ſeen. They begin their ſong in the evening, and generally continue it the whole night. For weeks together, if undiſturbed, they ſit upon the ſame tree; and the inimitable Shakeſpear rightly deſcribes the nightingale ſitting nightly in the ſame place.

In the beginning of May, the nightingale prepares to make its neſt, which is formed of the leaves of trees, ſtraw, and moſs. The neſt being very eagerly ſought for, is as cunningly ſecreted; ſo that but very few of them are found by the boys when they go upon theſe purſuits. It is built at the bottom of hedges, where the buſhes are thickeſt and beſt covered. Whilſt the female continues ſitting, the male at a good diſtance, but always within hearing, chears the patient hour with his voice, and, by the ſhort interruption of his ſong, often gives her warning of approaching danger. She lays four or five eggs; of which but a part, in our cold climate, attain to maturity.

The delicacy, or rather the fame, of this bird's muſic, has induced many to abridge its liberty to ſecure its harmony. Its ſong, however, in captivity is not very alluring; and the tyranny of taking it from thoſe hedges where only it is moſt pleaſing, ſtill more depreciates its impriſoned efforts. Geſner aſſures us, that it is not only the moſt agreeable ſongſter in a cage, but that it poſſeſſes a moſt admirable faculty of talking. He tells the following ſtory in proof of his aſſertion, which he ſays was communicated to him by a friend. " Whilſt I was at Ratiſbone," ſays his correſpondent, " I put up at an inn, the ſign of the Golden Crown, where my hoſt had three nightingales. It happened at that time, being the ſpring of the year, when thoſe birds are accuſtomed to ſing, that I was ſo afflicted with the ſtone, that I could ſleep but very little all night. It was uſual then about midnight, to hear the two nightingales jangling, and talking with each other, and plainly imitating men's diſcourſes. Beſides repeating the daily diſcourſe of the gueſts, they chanted out two ſtories. One of their ſtories was concerning the tapſter and his wife, who refuſed to follow him to the wars; for the huſband endeavoured to perſuade his wife, as far as I could learn from the birds, that he would leave his ſervice in that inn, and go to the wars in hopes of plunder. But ſhe refuſed to follow him, reſolving to ſtay either at Ratiſbone, or go to Nuremberg. There was a long and earneſt contention between them; and all this dialogue the birds repeated. They even repeated the unſeemly words which were caſt out between them, and which ought rather to have been ſuppreſſed. The other ſtory was concerning the war which the emperor was then threatening againſt the proteſtants; which the birds probably heard from ſome of the generals that had conferences in the houſe. Theſe things they repeated in the night after twelve o'clock, when there was a deep ſilence. But in the day time, for the moſt part, they were ſilent, and ſeemed to do nothing but revolve with themſelves upon what the gueſts conferred together as they ſat at table, or in their walks."

Such is the ſagacity aſcribed to the nightingale. But there is a little bird, rather celebrated for its affection to mankind than its ſinging, which however, in our climate, has the ſweeteſt note of all others. The reader already perceives that I mean the RED-BREAST, the well-known friend of man, which is found in every hedge, and makes it vocal. The note of other birds is louder, and their inflections more capricious; but this bird's voice is ſoft, tender, and well ſupported; and the more to be valued as we enjoy it the greateſt part of the winter. If the nightingale's ſong has been compared to the fiddle, the red-breaſt's voice has all the delicacy of the flute.

The Lark.

The Lark, whether the ſky-lark, the wood, or the tit-lark, being all diſtinguiſhable from other little birds by the length of their heel, are louder in their ſong than either of the former, but not ſo pleaſing. Indeed, the muſic of every bird in captivity produces no very pleaſing ſenſations. It is but the mirth of a little animal inſenſible of its unfortunate ſituation. It is the landſcape, the grove, the golden break of day, the conteſt upon the hawthorn, the fluttering from branch to branch, the ſoaring in the air, and the anſwering of its young, that gives the bird's ſong its true reliſh. Theſe united, improve each other, and raiſe the mind to a ſtate of the higheſt, yet moſt harmleſs exultation.

The lark builds its neſt upon the ground, beneath ſome turf that ſerves to hide and ſhelter it. The female lays four or five eggs, of a duſky hue in colour, ſomewhat like thoſe of a plover. It is while ſhe ſits that the male uſually entertains her with his ſinging; and while he is riſen to an imperceptible height, yet he ſtill has his loved partner in his eye, nor once loſes ſight of the neſt either while he aſcends or deſcends. This harmony continues ſeveral months, beginning early in the ſpring on pairing. In winter, they aſſemble in flocks, when their ſong forſakes them, and they are caught in great numbers for the luxury of the table.

The Black-cap and the Wren.

The Black-cap and the Wren, though ſo very diminutive, are yet prized by ſome for their ſinging. The former is called by ſome the mock nightingale; and the latter is admired for the loudneſs of its note, compared to the little body whence it iſſues.

The Canary-Bird.

The Canary-bird is now become ſo common, and has continued ſo long in a domeſtic ſtate, that its native habits, as well as its native country, ſeem almoſt forgotten. Though, by the name, it appears that theſe birds came originally from the Canary Iſlands, yet we have them only from Germany, where they are bred up in great numbers, and ſold into different parts of Europe.

In its native iſlands, a region no leſs diſtinguiſhed for the beauty of its landſcapes than the harmony of its groves, the canary-bird is of a duſky grey colour, and ſo different from thoſe uſually ſeen in Europe, that ſome have even doubted whether it be of the ſame ſpecies. With us, they have that variety of colouring uſual in all domeſtic fowls. Some are white, ſome mottled, and ſome are beautifully ſhaded with green; but they are more eſteemed for their note than their beauty. For they have a high piercing pipe, as indeed all thoſe of the finch tribe have, continuing for ſome time in one breath without intermiſſion, then raiſing it higher and higher by degrees, with great variety.

The Linnet and the Goldfinch.

The linnet and the goldfinch are ſo very like the canary-bird, that they have ſcarcely any peculiarities that can attract our curioſity. The gold-finch learns a fine ſong from the nightingale; and the linnet and bull-finch may be taught to forget the wild notes of nature, and to whiſtle a long and regular tune.

Of the Swallow and its Affinities.

In this tribe is to be found the Goat ſucker, which may be ſtyled a nocturnal ſwallow. It is the largeſt of this kind, and is known by its tail, which is not forked, like that of the common ſwallow. It begins its flight at evening, and makes a loud ſingular noiſe, like the whur of a ſpinning-wheel. To this kind alſo belongs the Houſe-ſwallow, which is too well known to need a deſcription: the Martin is inferior in ſize to the former, and the tail is much leſs forked. It differs alſo in its neſt, which is covered at top, while that of the houſe-ſwallow is open; and the Swift, rather larger than the houſe-ſwallow, with all the toes ſtanding forward; in which it differs from the reſt of its kind. All theſe reſemble each other ſo ſtrongly, that it is not without difficulty the ſmaller kinds are known aſunder.

Theſe are all known by their very large mouths, which, when they fly are always kept open. They are not leſs remarkable for their ſhort ſlender feet, which ſcarcely are able to ſupport the weight of their bodies. Their wings are of immoderate extent for their bulk. Their plumage is gloſſed with a rich purple; and their note is a ſlight twittering, which they ſeldom exert but upon the wing.

This peculiar conformation ſeems attended with a ſimilar peculiarity of manners. Their food is inſects, which they always purſue flying. For this reaſon, during fine weather, when the inſects are moſt likely to be abroad, the ſwallows are for ever upon the wing, and ſeen purſuing their prey with amazing ſwiftneſs. All ſmaller animals, in ſome meaſure, find ſafety by winding and turning, when they endeavour to avoid the greater. The lark thus evades the purſuit of the hawk; and man the crocodile. In this manner, inſects upon the wing endeavour to avoid the ſwallow; but this bird is admirably fitted by nature to purſue them through their ſhorteſt turnings. Beſides a great length of wing, it is alſo provided with a long tail, which, like a rudder, turns it in its moſt rapid motions; and thus, whilſt it is poſſeſſed of the greateſt ſwiftneſs, it is alſo poſſeſſed of the moſt extreme agility.

The neſt of theſe birds is built with great induſtry and art; particularly by the common ſwallow, which builds it on the tops of chimnies. The martin ſticks it to the eaves of houſes. The goat ſucker, as we are told, builds it on the bare ground. This neſt is built with mud from ſome neighbouring brook, well tempered with the bill, moiſtened with water for the better adheſion, and ſtill farther kept firm, by long graſs and fibres. Within it is lined with gooſe feathers, which are ever the warmeſt and the neateſt. The martin covers its neſt at top, and has a door to enter at. The ſwallow on the other hand, leaves her's quite open. But our European neſts are nothing to be compared with thoſe the ſwallow builds on the coaſts of China and Coromandel; the deſcription of which I will give, in the plain honeſt phraſe of Willoughby. "On the ſea-coaſt of the kingdom of China," ſays he, "a ſort of party-coloured birds, of the ſhape of ſwallows, gather a certain clammy, gluttinous matter, perhaps the ſpawn of whales and other young fiſhes, of which they build their neſts, wherein they lay their eggs and hatch their young. Theſe neſts the Chineſe pluck from the rocks, and bring them in great numbers, into the Eaſt-Indies to ſell. They are eſteemed, by gluttons, as great delicacies; who, diſſolving them in chicken, or mutton-broth, are very fond of them; far before oyſters, muſh-rooms, or other dainty and lickoriſh morſels."

At the latter end of September the ſwallows leave us; and a few days before their departure, they aſſemble, in vaſt flocks, on houſe-tops, as if to deliberate on the fatiguing journey that lay before them. This is no ſlight undertaking, as their flight is directed to Congo, Senegal, and along the whole Morocco ſhore. There are ſome, however, left behind in this general expedition, that do not part till eight or ten days after the reſt. Theſe are chiefly the latter weakly broods, which are not yet in a condition to ſet out.

Thoſe that migrate are firſt obſerved to arrive in Africa about the beginning of October. They are thought to have performed their fatiguing journey in the ſpace of ſeven days. They are ſometimes ſeen, when interrupted by contrary winds, wavering in their courſe far off at ſea, and lighting upon whatever ſhip they find in their paſſage. They then ſeem exhauſted with famine and fatigue, yet ſtill they boldly venture, when refreſhed by a few hours reſt, to renew their flight and to continue the courſe which they had been ſteering before.

Of the Humming-Bird and its Varieties.

Of this charming little animal, there are ſix or ſeven varieties, from the ſize of a ſmall wren, down to that of an humble-bee. An European could never have ſuppoſed a bird exiſting ſo very ſmall, and yet completely furniſhed out with a bill, feathers, and inteſtines, exactly reſembling thoſe of the largeſt kind. A bird not ſo big as the end of one's little finger, would probably be ſuppoſed but a creature of imagination, were it not ſeen in infinite numbers, and as frequent as butterflies in a ſummer day, ſporting in the fields of America, from flower to flower, and extracting their ſweets with its little bill.

The ſmalleſt humming bird is about the ſize of an hazel-nut. The feathers on its wings and tail are black; but thoſe on its body, and under its wings, are of a greeniſh brown, with a fine red caſt or gloſs, which no ſilk or velvet can vie with. It has a ſmall creſt on its head, green at the bottom, and as it were gilded at the top; and which ſparkles in the ſun like a little ſtar in the middle of its forehead. The bill is black, ſtraight, ſlender, and of the length of a ſmall pin. The larger humming-bird is near half as big as the common wren, and without a creſt on its head; but, to compenſate for this, it is covered, from the throat half way down the belly, with changeable crimſon-coloured feathers, which in different lights, change to a variety of beautiful colours, mnch like an opal. The heads of both are ſmall, with very little round eyes as black as jet.

It is inconceivable how much theſe add to the high finiſhing and beauty of a rich luxurious weſtern landſcape. As ſoon as the ſun is riſen, the humming-birds, of different kinds, are ſeen fluttering about lighting upon them. Their wings are in ſuch rapid motion, that it is impoſſible to diſcern their colours, except by their glittering. They are never ſtill, but continually in motion, viſiting flower after flower, and extracting its honey. For this purpoſe they are furniſhed with a forked tongue, that enters the cup of the flower, and extracts its nectared tribute. Upon this alone they ſubſiſt. The rapid motion of their wings brings out an humming ſound, whence they have their name.

The neſts of theſe birds are not leſs curious than thoſe of the reſt. They are ſuſpended in the air, at the point of the twigs of an orange, a pomegranate, or a citron tree; ſometimes even in houſes, if they find a ſmall and convenient twig for the purpoſe. The female is the architect, while the male goes in queſt of materials; ſuch as cotton, fine moſs, and the fibres of vegetables. The neſt is about the ſize of a hen's egg cut in two. They lay two eggs at a time, and never more, about the ſize of ſmall peas, and as white as ſnow, with here and there a yellow ſpeck. The time of incubation continues twelve days; at the end of which the young ones appear, and are much about the ſize of a blue-bottle-fly.

It is doubtful whether or not theſe birds have a continued note in ſinging. All travellers agree that, beſide the humming noiſe produced by their wings, they have a little interrupted chirrup; but Labat aſſerts, that they have a moſt pleaſing plaintive melody in their voices, though ſmall and proportioned to the organs which produce it. It is very probable that, in different places, their notes are alſo different; and as there are ſome that continue torpid all the winter, there may likewiſe be ſome with agreeable voices.

CHAP. XXVII.

OF THE CRANE SPECIES.—THE CRANE.—THE STORK.—THE BALEARIC CRANE, AND OTHER FOREIGN CRANES.—THE BUFFOON BIRD.—THE HERON.—THE BITTERN.—THE SPOON-BILL.—THE FLAMINGO.—THE SCOOPER—THE RUNNER—THE CURLEW—THE GODWIT—THE WOODCOCK.—THE SNIPE.—THE RUFF.—THE LAPWING AND PLOVER.—THE DOTTREL.—THE SEA-LARK.—THE WATER-HEN.—THE COOT, &C.

The Crane.

WILLOUGHBY and Pennant make the crane from five to ſix feet long, from the tip to the tail. Others ſay, that it is above five feet high; and others that it is as tall as a man. A bird, however, the body of which is not larger than that of a turkey-hen, and acknowledged on all hands not to weigh above ten pounds, cannot be ſuppoſed to be almoſt as long as an oſtrich. Briſſon, therefore, ſeems to give this bird its real dimenſions, when he deſcribes it about three feet high, and about four from the tip to the tail. But, perhaps, that from which he took his dimenſions, was one of the ſmalleſt of the kind.

It is a tall, ſlender bird, with a long neck and long legs. The top of the head is covered with black briſtles, and the back of it is bald and red, which ſufficiently diſtinguiſhes it from the ſtork, to which it is very nearly allied in ſize and figure. The plumage, in general, is aſh-coloured; and there are two large tufts of feathers, that ſpring from the pinion of each wing. Theſe bear a reſemblance to hair, and are finely coloured at the ends, which the bird has a power of erecting and depreſſing at pleaſure. Geſner ſays, that theſe feathers, in his time, uſed to be ſet in gold, and worn as ornaments in caps.

The crane is a very ſocial bird, and they are ſeldom ſeen alone. They generally fly or ſit in flocks of fifty or ſixty together; and while a part feed, the reſt ſtand like centinels upon duty. It for the moſt part ſubſiſts upon vegetables; and is known in every country of Europe, except our own. As they are birds of paſſage, they are ſeen to depart and return regularly at thoſe ſeaſons when their proviſion invites or repels them. They for the moſt part leave Europe about the latter end of autumn, and return in the beginning of ſummer. In the inland parts of the continent, they are ſeen croſſing the country, in flocks of fifty or an hundred, from the northern regions towards the ſouth. In theſe migrations, however, if a field of corn offers in their way, they will ſtop a while to regale upon it. On ſuch occaſions they do incredible damage, chiefly in the night; and the huſbandman, who lies down in joyful expectation, riſes in the morning to ſee his fields laid entirely waſte, by an enemy, whoſe march is too ſwift for his vengeance to overtake.

The cold arctic region ſeems to be this bird's favourite abode. They come down into the more ſouthern parts of Europe rather as viſitants than inhabitants.

In their journeys it is amazing to conceive the heights to which they aſcend, when they fly. Their note is the loudeſt of all birds; and is often heard in the clouds, when the bird itſelf diſappears entirely. As it is light for its ſize, and ſpreads a large expanſe of wing, it is capable of floating at the greateſt height, where the air is lighteſt; and as it ſecures its ſafety, and is quite out of the reach of man, it flies in tracts which would be too fatiguing for any other bird to purſue.

In theſe aerial journeys, though unſeen themſelves, they have the diſtincteſt viſion of every object below. They govern and direct their flight by their cries: and exhort each other to proceed or deſcend, when a fit opportunity offers for depredation. As they riſe but heavily, they are very ſhy birds, and ſeldom let the fowler approach them. Corn is their favourite food; but there is ſcarcely any other that comes amiſs to them. Redi, who opened ſeveral, found the ſtomach of one full of the herb called dandelion; that of another was filled with beans; a third had a great quantity of clover in its ſtomach; while thoſe of two others filled with earth-worms and beetles. In ſome he found lizards and ſea-fiſh; in others, ſnails, graſs, and pebbles, ſwallowed perhaps for medicinal purpoſes.

In general it is a peaceful bird, both in its own ſociety, and with reſpect to thoſe of the foreſt. It is eaſily tamed; and if we can believe Albertus Magnus, it has a particular affection for man.

Storks.

Storks are birds of paſſage, like the former; but it is hard to ſay whence they come or whither they go. When they withdraw from Europe, they all aſſemble on a particular day, and never leave one of their company behind them. They take their flight in the night: hence the way they go has never been obſerved. They generally return into Europe in the middle of March, and make their neſts on the tops of chimnies and houſes as well as on high trees. The females lay from two to four eggs, of the ſize and colour of thoſe of geeſe. They are a month in hatching; and when their young are excluded, they are particularly ſolicitous for their ſafety.

As the food of theſe birds conſiſts in a great meaſure of frogs and ſerpents, it is not to be wondered at that different nations have paid them a particular veneration. The Dutch are very ſolicitous for the preſervation of the ſtork in every part of their republic. It ſeems to have taken refuge among their towns; and builds on the tops of their houſes without any moleſtation. It reſts familiarly in their ſtreets, and is protected as well by the laws as the prejudices of the people.

The Balearic Crane.

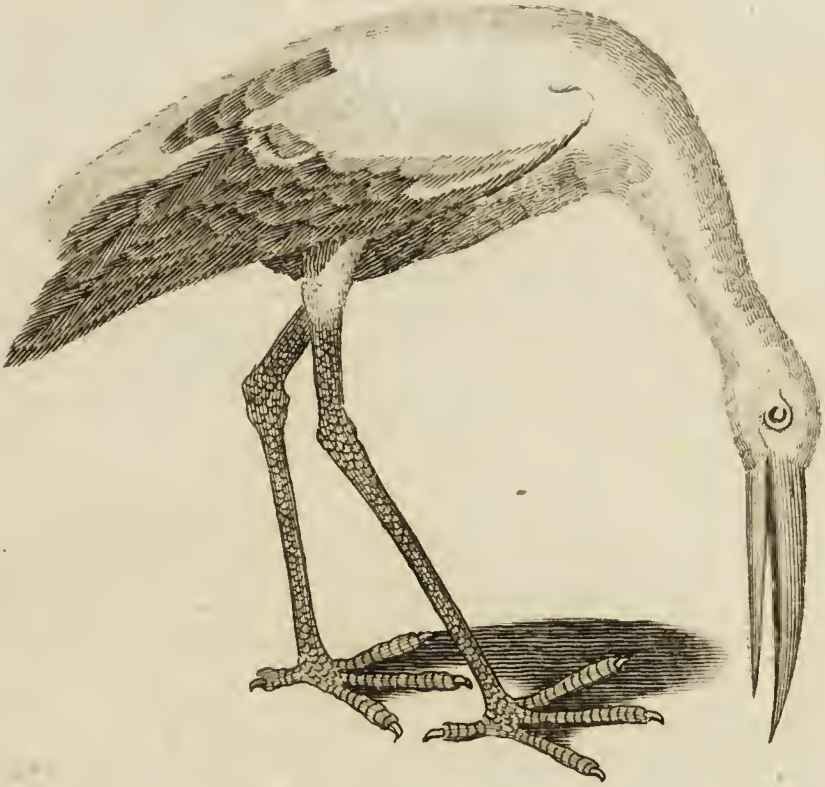
The balearic crane was unknown, till we became acquainted with the birds of tropical climates, when one of the crane kind with a topping was brought into Europe, and deſcribed by Aldrovandus as Pliny's balearic crane. It is nearly of the ſhape and ſize of the ordinary crane, with long legs and a long neck, like others of the kind; but the bill is ſhorter, and the colour of the feathers is of a dark greeniſh grey. The head and throat form the moſt ſtriking part of this bird's figure. On its head is a thick round creſt, made of briſtles, which ſpreads every way, and which reſembles rays ſtanding out in every different direction. The longeſt of theſe rays are about three inches and an half; and they are all topped with a kind of black taſſels, which give them a beautiful appearance. The ſides of the head and cheeks are bare, whitiſh, and edged with red, while underneath the throat hangs a kind of bag or wattle, like that of a cock, but not divided into two. This bird comes from the coaſt of Africa and the Cape de Verd Iſlands. When it runs, it ſtretches out its wings, and goes very ſwiftly, at other times its uſual motion is very ſlow. In their domeſtic ſtate, they walk very deliberately among other poultry, and ſuffer themſelves to be approached by every ſpectator. They never rooſt in houſes. But about night, when they are diſpoſed to reſt, they ſearch out ſome high wall, on which they perch in the manner of a peacock. Indeed, they ſo much reſemble that bird in manners and diſpoſition, that ſome have deſcribed them by the name of the ſea-peacock. But, though their voice and rooſting be ſimilar, their food, which is entirely upon greens, vegetables, and barley, ſeems to be ſomewhat different.

Under this head of foreign birds of the crane-kind, it will be proper to mention the Jabiru and the Jabiru Guacu, both natives of Braſil. Of theſe great birds of the crane-kind we know but little, except the general out-line of their figure, and the enormous bills which we often ſee preſerved in the cabinets of the curious. The bill of the latter is

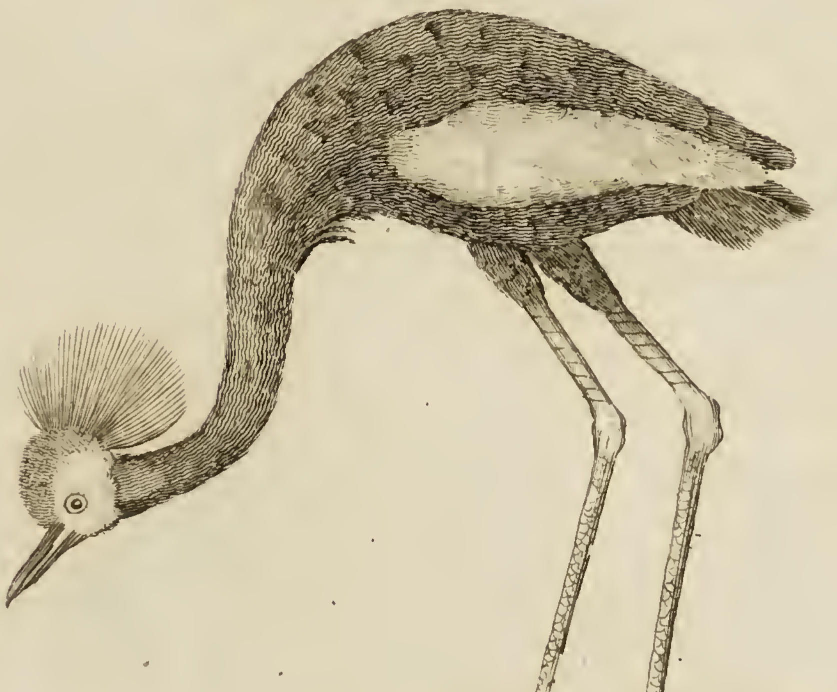
red,

Plate 26.

The White Stork.



The Balearic Crane.



J. Fraser sc.

red, and thirteen inches long: the bill of the former is black, and is eleven. Neither of them, however, are of a ſize proportioned to their immoderate length of bill. The jabiru guacu is not above the ſize of a common ſtork, while the jabiru with the ſmalleſt bill exceeds the ſize of a ſwan. They are both covered with white feathers, except the head and neck, that are naked; and their principal difference is in the ſize of the body and make of the bill. The lower chap of the jabiru guacu being broad, and bending upwards.

A bird ſtill more extraordinary may be added to this claſs, called the Anhima, which, like the two former, is a native of Braſil. This is a water-fowl of the rapacious kind, and bigger than a ſwan. The head, which is ſmall for the ſize of the body, has a black bill not above two inches long; but what diſtinguiſhes it in particular is a horn growing from the forehead as long as the bill, and bending forward like that of the fabulous unicorn of the ancients. This horn, which is as round as if it were turned in a lathe, and of an ivory colour, is not much thicker than a crow quill. But this is not the only inſtrument of battle this formidable bird carries. It ſeems to be armed at all points; for at the fore-part of each wing, at the ſecond joint, ſpring two ſtraight triangular ſpurs, about as thick as one's little finger. The foremoſt of theſe goads or ſpurs is above an inch long: the hinder is ſhorter, and both are of a duſky colour. Their claws alſo are long and ſharp: their colour is black and white; and they cry very loud. They are never found alone, but always in pairs. The cock and hen prowl together; and their fidelity is ſaid to be ſuch, that when one dies, the other never departs from the carcaſe, but dies with its companion. It makes its neſt of clay, near the bodies of trees, upon the ground, of the ſhape of an oven.

One bird more may be ſubjoined to this claſs, not for the oddity of its figure, but for the peculiarity of its manners. It is vulgarly called by our ſailors, the Buffon bird, and by the French the damoiſelle, or lady. The peculiar geſtures and contortions of this bird, the proper name of which is the Numidian Crane, are extremely ſingular. It ſtoops, riſes, lifts one wing, then another, turns round, ſails forwards, then back again. All this highly diverts our ſeamen; who perhaps do not imagine, that all theſe contortions are but the awkward expreſſion not of the poor creature's pleaſures, but of its fears.

It is a very ſcarce bird: the plumage is of a leaden grey; but it is diſtinguiſhed by fine white feathers, conſiſting of long fibres, which fall from the back of the head, about four inches long. The fore-part of the neck however is adorned with black feathers, compoſed of very fine, ſoft, and long fibres, that hang down upon the ſtomach, and give the bird a very graceful appearance.

Of the Heron and its Varieties.

Of this tribe, Briſſon has enumerated not leſs than forty-ſeven ſorts, all differing in their ſize, figure, and plumage; and with talents adapted to their place of reſidence, or their peculiar purſuits. But, how various ſoever the heron kind may be in their colours or their bills, they all ſeem to poſſeſs the ſame manners, and have but one character of cowardice and rapacity, indolence, yet inſatiable hunger. Other birds are found to grow fat by an abundant ſupply of food; but theſe, though exceſſively voracious, have always lean and carrion bodies, as if not even plenty were ſufficient for their ſupport.

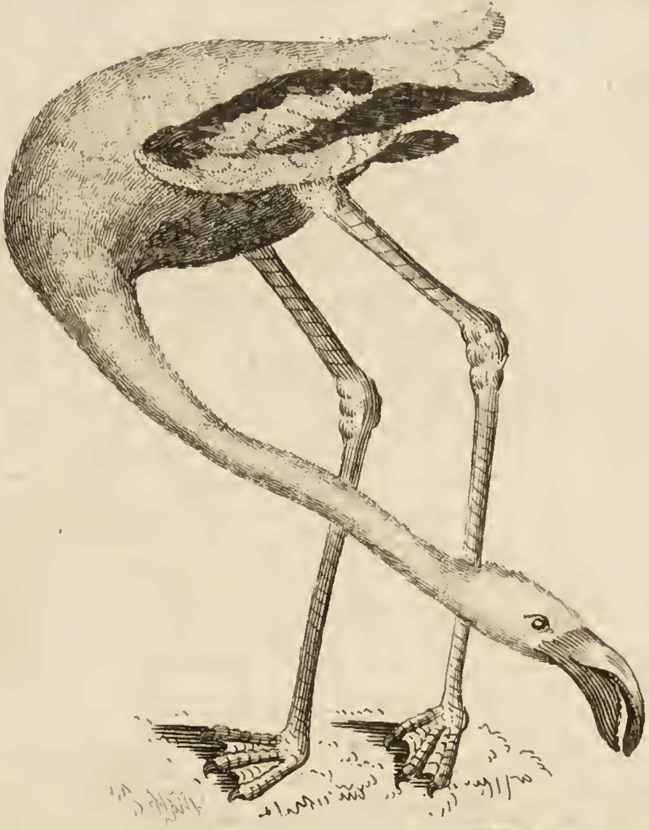
The common heron is remarkably light, in proportion to its bulk, ſcarce weighing three pounds and an half, yet it expands a breadth of wing which is five feet from the tip of the one to that of the other. Its bill is very long, being five inches from the point to the baſe: its claws are long, ſharp, and the middlemoſt toothed like a ſaw. Yet, thus armed as it appears for war, it is indolent and cowardly, and even flies at the approach of a ſparrow-hawk. Of all birds, this commits the greateſt devaſtation in freſh-waters; and there is ſcarcely a fiſh, though ever ſo large, that he will not ſtrike at though unable to carry it away. But the ſmall fry are his chief food. Theſe, purſued by their larger fellows of the deep, are obliged to take refuge in ſhallow waters, where they find the heron a ſtill more formidable enemy. His method is to wade as far as he can go into the water, and there patiently to wait the approach of his prey, which when it comes within ſight, he darts upon it with an inevitable aim. In this manner he is found to deſtroy more in a week than an otter in three months. "I have ſeen an heron," ſays Willoughby, "that had been ſhot, that had ſeventeen carps in his belly at once, which he will digeſt in ſix or ſeven hours. I have ſeen a carp," continues he, "taken out of a heron's belly, nine inches and an half long. Several gentlemen who kept tame herons, to try what quantity one of them would eat in a day, have put ſeveral ſmaller roach and dace in a tub; and they have found him eat fifty in a day, one day with another. In this manner a ſingle heron will deſtroy fifteen thouſand carp in half a year."

But, though in ſeaſons of fine weather the heron can always find a plentiful ſupply; in cold or ſtormy ſeaſons, his prey is no longer within reach. The fiſh that before came into the ſhallow water now keep in the deep, as they find it to be the warmeſt ſituation. Frogs and lizards alſo ſeldom venture from their lurking places; and the heron is obliged to ſupport himſelf upon his long habits of patience, and even to take up with the weeds that grow upon the water. At thoſe times he contracts a conſumptive diſpoſition, which ſucceeding plenty is not able to remove; ſo that the meagre glutton ſpends his time between want and riot, and feels alternately the extremes of famine and exceſs. Hence, notwithſtanding the care with which he takes his prey, and the amazing quantity he devours, the heron is always lean and emaciated; and though his crop be uſually found full, yet his fleſh can hardly cover the bones.

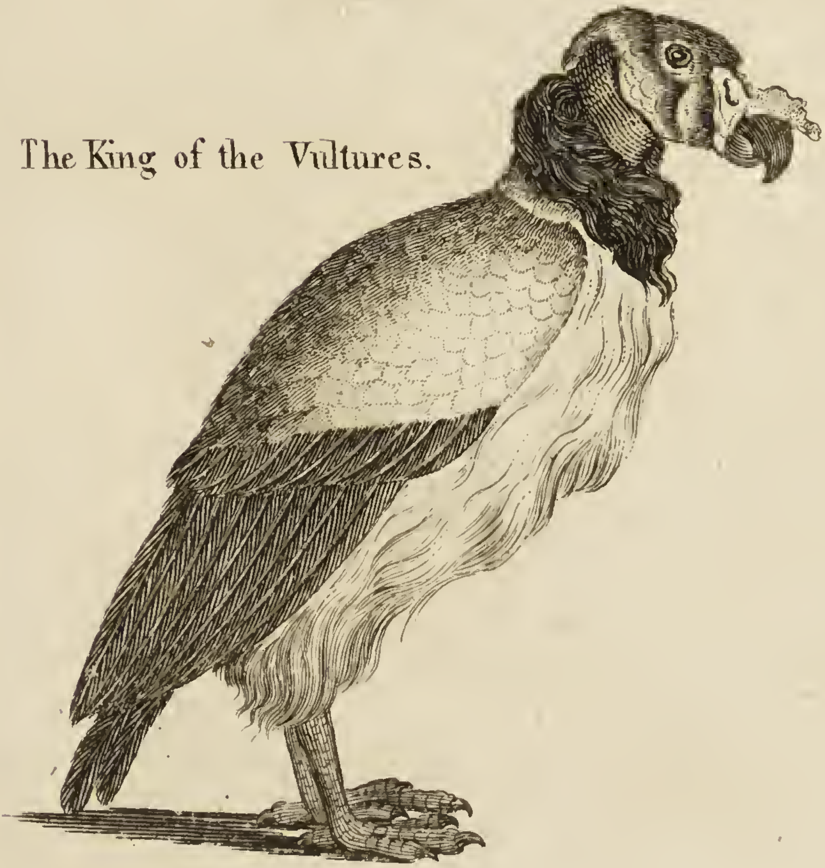
Though this bird lives chiefly among pools and marſhes, yet its neſt is built on the tops of the higheſt trees, and ſometimes on cliffs hanging over the ſea. They are never in flocks when they fiſh, but commit their depredations in ſolitude and ſilence. In making their neſts however they love each others ſociety; and they are ſeen, like rooks, building in company with flocks of their kind. Their neſts are made of ſticks and lined with wool; and the female lays four large eggs of a pale green colour. The obſervable indolence of their nature, however, is not leſs ſeen in their neſtling than in their habits of depredation. Nothing is more certain, and I have ſeen it an hundred times, than that they will not be at the trouble of building a neſt when they can get

Plate 30.

The Flamingo.



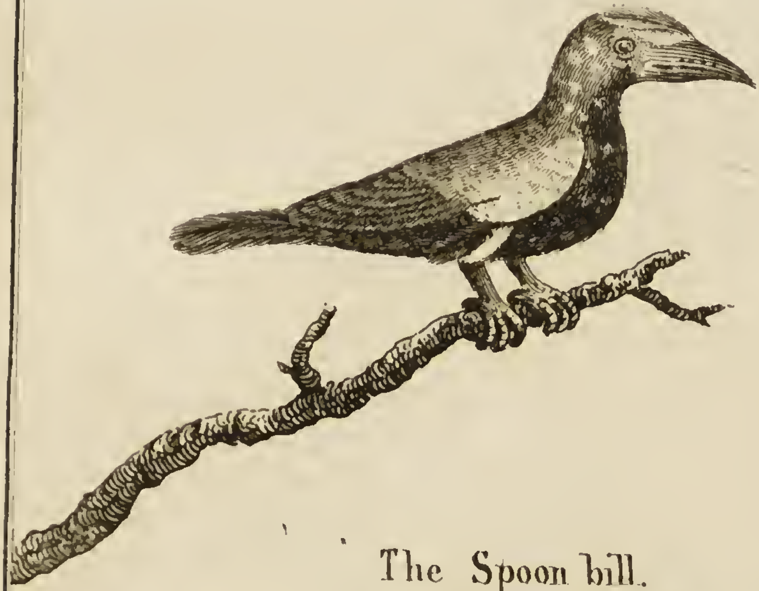
The King of the Vultures.



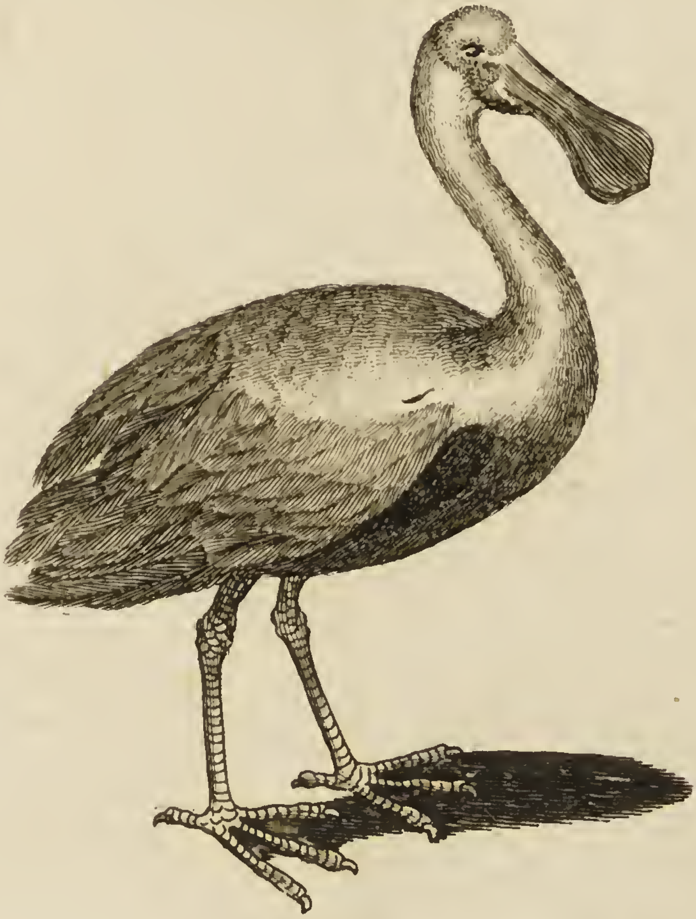
J. Fraſer ſc.

Plate 29.

The Calao *or* Horned Indian Raven.



The Spoon bill.



J. Fraser sc.

one made by the rook, or deſerted by the owl. This they uſually enlarge and line within, driving off the original poſſeſſors ſhould they happen to renew their claims.

The heron is ſaid to be a very long-lived bird: by Mr Keyſler's account it may exceed ſixty years. One too was taken in Holland, by an hawk belonging to the ſtadtholder, having a ſilver plate faſtened to one leg, with an inſcription, ſignifying that it had been ſtruck by the elector of Cologne's hawks thirty-five years before.

Of the Bittern or Mire-Drum.

Thoſe who have walked in an evening by the ſedgy ſides of unfrequented rivers, muſt remember the loud ſcream of the wild gooſe, the croaking of the mallard, the whining of the lapwing, and the tremulous neighing of the jack ſnipe. But of all thoſe ſounds, there is none ſo diſmally hollow as the booming of the bittern. It is impoſſible for words to give thoſe who have not heard this evening-call an adequate idea of its ſolemnity. It is like the interrupted bellowing of a bull, but hollower and louder, and is heard at a mile's diſtance, as if iſſuing from ſome formidable being that reſided at the bottom of the waters.

The bird, however, that emits this terrifying ſound is not ſo big as an heron, with a weaker bill, and not above four inches long. It differs from the heron chiefly in its colour, which is in general of a paleiſh yellow, ſpotted and barred with black. Its wind-pipe is fitted to produce the ſound for which it is remarkable; the lower part of it dividing into the lungs is ſupplied with a thin looſe membrane, that can be filled with a large body of air, and exploded at pleaſure. Theſe bellowing exploſions are chiefly heard from the beginning of ſpring to the end of autumn; and, however awful they may ſeem to us, are the calls to courtſhip, or connubial enjoyment.

This bird, though of the heron kind, is yet neither ſo deſtructive nor ſo voracious. It is a timid animal, concealing itſelf in the midſt of reeds and marſhy places, and living upon frogs, inſects, and vegetables; and though it is not unlike the heron in figure, yet it is of very different manners and appetites. It makes its neſt in a ſedgy margin, or amidſt a tuft of ruſhes, and compoſes its ſimple habitation of ſedges, the leaves of water plants, and dry ruſhes. It lays generally ſeven or eight eggs of an aſh-green colour, and in three days leads its little ones to their food.

The fleſh of the bittern is in great eſteem among the luxurious. For this reaſon, it is eagerly ſought after by the fowler; and as it is a ſlow-winged bird, it does not often eſcape him. Indeed, it ſeldom riſes but when almoſt trod upon; and ſeems to ſeek protection rather from concealment than flight. At the latter end of autumn, however, in the evening, its wonted indolence appears to forſake it. It is then ſeen to riſe in a ſpiral aſcent till it is quite loſt from the view, and makes at the ſame time a ſingular noiſe very different from its former boomings.

The Spoonbill.

The Spoonbill is one of thoſe birds which differs a good deal from the crane, yet approaches this claſs more than any other. The body is more bulky for its height, and the bill is very differently formed from that of any other bird whatever. Yet ſtill is a comparatively tall bird: it feeds among waters: its toes are divided; and it ſeems to poſſeſs the natural diſpoſitions of the crane. The European ſpoonbill is of about the bulk of a crane; but as the one is above four feet high, the other is not more than three feet three inches. The common colour of thoſe of Europe, is a dirty white; but thoſe of America are of a beautiful roſe colour, or of a delightful crimſon. Beauty of plumage ſeems indeed, to be the prerogative of all the birds of that continent. The bill, which in this bird is ſo very particular, is about ſeven inches long, and running out broad at the end, as its name denotes, it is there about an inch and a half wide. This ſtrangely faſhioned inſtrument, in ſome is black: in others it is of a light grey; and in thoſe of America, it is of a red colour, like the reſt of the body. All round the upper chap there runs a kind of rim, with which it covers that beneath. Its cheeks and its throat are without feathers, and covered with a black ſkin.

The Shoveler.

The Shoveler chiefly feeds upon frogs, toads, and ſerpents; of which, particularly at the Cape of Good Hope, they deſtroy great numbers. The inhabitants of that country hold them in as much eſteem as the ancient Egyptians did the ibis. The ſhoveler runs tamely about their houſes; and they are content with its ſociety, as an uſeful though an homely companion. They are never killed; and indeed they are good for nothing when they are dead.

This bird breeds in Europe, in company with the heron, in high trees; and in a neſt formed of the ſame materials.

It lays from three to five eggs; white, and powdered with a few ſanguine or pale ſpots.

The Flamingo.

The Flamingo is the moſt remarkable of all the crane kind, the talleſt, largeſt, and the moſt beautiful. The body, which is of a beautiful ſcarlet, is no bigger than that of a ſwan; but its legs and neck are of ſuch an extraordinary length, that when it ſtands erect, it is ſix feet ſix inches high. Its wings, extended, are five feet ſix inches from tip to tip; and it is four feet eight inches from tip to tail. The head is round and ſmall, with a large bill, ſeven inches long, partly red, partly black, and crooked like a bow. The legs and thighs, which are not much thicker than a man's finger, are about two feet eight inches high; and its neck near three feet long. The feet are not furniſhed with ſharp claws, as in others of the crane kind; but feeble, and united by membranes, as in thoſe of the gooſe. Of what uſe theſe membranes are, does not appear, as the bird is never ſeen to ſwim, its legs and thighs being ſufficient for bearing it into thoſe depths where it ſeeks for prey.

This extraordinary bird is now chiefly found in America, but was once known on all the coaſts of Europe. Its beauty, its ſize, and the peculiar delicacy of its fleſh, have been ſuch temptations to deſtroy or take it, that it has long ſince deſerted the ſhores frequented by man, and taken refuge in countries that are as yet but thinly peopled.

When the Europeans firſt came to America, and coaſted down along the African ſhores, they found the flamingos on ſeveral ſhores on either continent, gentle, and no way diſtruſtful of mankind. When the fowler had killed one, the reſt of the flock, far from attempting to fly, only looked on the fall of their companion in a kind of fixed aſtoniſhment.

Another and another ſhot was diſcharged; and thus the fowler often levelled the whole flock, before one of them began to think of eſcape.

But at preſent it is very different in that part of the world; and the flamingo is not only one of the ſcarceſt but of the ſhyeſt birds in the world. They chiefly keep near the moſt deſerted and inhoſpitable ſhores; near ſalt-water lakes and ſwampy iſlands. When ſeen by mariners in the day, they always appear drawn up in a long cloſe line of two or three hundred together; and, as Dampier tells us, at the diſtance of half a mile, they repreſent a long brick wall. Their rank, however, is broken when they ſeek for food; but they always appoint one of the number as a watch, whoſe only employment is to obſerve and in caſe of danger to apprize the reſt. As ſoon as this truſty centinel perceives the remoteſt appearance of danger, he gives a loud ſcream, with a voice as ſhrill as a trumpet, and inſtantly the whole cohort are upon the wing. The fleſh of the old ones is black and hard; though, Dampier ſays, delicious: that of the young ones is better. But, of all delicacies, the flamingo's tongue is the moſt celebrated. In fact, the Roman emperors conſidered the tongue of the flamingo as the higheſt luxury; and we have an account of one of them, who procured fifteen hundred flamingos' tongues to be ſerved up in a ſingle diſh. The tongue of this bird, which is ſo much ſought after, is a good deal larger than that of any other bird whatever. The bill of the flamingo is like a large black box, of an irregular figure, and filled with a tongue which is black and griſtly.

Their time of breeding is according to the climate in which they reſide: in North America they bread in our ſummer; on the other ſide the line they take the moſt favourable ſeaſon of the year. They build their neſts in extenſive marſhes, and where they are in no danger of a ſurprize. The neſt is raiſed from the ſurface of the pool about a foot and a half, formed of mud, ſcraped up together, and hardened by the ſun, or the heat of the bird's body: it reſembles a truncated cone, or one of the pots which we ſee placed on chimnies. On the top it is hollowed out to the ſhape of the bird, and in that cavity the female lays her eggs, without any lining but the cemented mud that forms the ſides of the building. She only lays two eggs, and, as her legs are immoderately long, ſhe ſtraddles on the neſt, while her legs hang down, one on each ſide into the water. It is a long time before the young are able to fly; but they run with amazing ſwiftneſs. They are ſometimes caught; and, very different from the old ones, ſuffer themſelves to be carried home, and are tamed very eaſily.

The Avoſetta, or ſcooper.

The Avoſetta, or Scooper, is chiefly found in Italy, and now and then comes into England. It is about the ſize of a pigeon, is a pretty erect bird, and has extremely long legs for its ſize; but the moſt extraordinary part of its figure is the bill, which turns up like a hook, in an oppoſite direction to that of the hawk or the parrot. This extraordinary bill is black, flat, ſharp and flexible at the end, and about three inches and a half long. From the circumſtance of this bird being bare a long way above the knee, it appears, that it lives and wades in the waters. It has a chirping, pert note, as we are told, and is web-footed, like the duck.

To this bird of the crane kind, ſo little known, I will add another, ſtill leſs known; the Corrira, or Runner. It has the longeſt legs of all web-footed fowls, the flamingo, and avoſetta: the bill is ſtraight, yellow, and black at the ends: the pupils of the eyes are ſurrounded with two circles; one of which is bay, and the other white. Below, near the belly, it is whitiſh: the tail, has two white feathers, and is black at the extremities; and the upper part of the body, is of the colour of ruſty iron.

To theſe birds of the crane kind may be added, a numerous tribe of ſmaller fowls, which are generally diſtinguiſhed by having their thighs partly bare. In this liſt is exhibited the Curlew, a bird of about the ſize of a duck, with a bill four inches long: the Woodcock, about the ſize of a pigeon, with a bill three inches long: the Godwit, of the ſame ſize, the bill four inches: the Green Shank, longer legged, the bill two inches and an half: the Red Shank, differing in the colour of its feet from the former: the Snipe, leſs by half, with a bill three inches. Then, with ſhorter bills,—the Ruff, with a collar of feathers round the neck of the male; the Knot, the Sand-piper, the Sanderling, the Dunlin, the Purro, and the Stint. To conclude, with bills very ſhort,—the Lapwing, the Green Plover, the Grey Plover, the Dottrel, the Turnſtone, and the Sea-Lark. Theſe, with their affinities, are properly natives or viſitants of this country, and are diſperſed along our ſhores, rivers, and watery grounds. To include the birds of this kind, belonging to other countries, the liſt would be very numerous; and the whole of this claſs, as deſcribed by Briſſon, would amount to near an hundred.

As theſe birds are uſually employed rather in running than in flying, and as their food lies entirely upon the ground, ſo they run with great ſwiftneſs for their ſize, and the length of their legs aſſiſts their velocity. But as, in ſeeking their food, they are often obliged to change their ſtation, ſo alſo are they equally ſwift of wing, and traverſe immenſe tracts of country, with little fatigue.

It has been thought by ſome, that a part of this claſs lived upon an oily ſlime, found in the bottoms of ditches and of weedy pools; but later diſcoveries have ſhewn, that, in theſe places, they hunt for the caterpillars, worms and inſects. The long-billed birds ſuck up worms and inſects from the bottom: thoſe furniſhed with ſhorter bills, pick up ſuch inſects as lie nearer the ſurface of the meadow, or among the ſands on the ſea-ſhore.

As all of this kind live entirely either in water, or among watery places, they ſeem provided by nature with a warmth of conſtitution to fit them for that cold element. They reſide, by choice, in the coldeſt climates; and, as other birds migrate here in our ſummer, their migrations hither are moſtly in the winter. Even thoſe that reſide among us the whole ſeaſon, retire, in ſummer, to the tops of our bleakeſt mountains; where they breed, and bring down their young when the cold weather begins.

The curlew, the woodcock, the ſnipe, the godwit, the grey plover, the green, and the long-legged plover, the knot, and the turnſtone, are rather the gueſts than the natives of this iſland, though the neſt of a ſtraggling curlew, or a ſnipe, is ſometimes found in our marſhes. They viſit us in the beginning of winter, and forſake us in the ſpring. They then retire to the mountains of Sweden, Poland, Pruſſia, and Lapland, to breed. Our country, during the ſummer ſeaſon, becomes uninhabitable to them. The ground parched by the heat, the ſprings dried up, and the vermicular inſects already upon the wing, they cannot ſubſiſt. Their weak and delicately-pointed bills are unfit to dig into a reſiſting ſoil; and their prey is departed, though they were able to reach its retreats. Thus, that ſeaſon when nature is ſaid to teem with life, and to put on her gayeſt liveries, is to them an interval of ſterility and famine.

The lapwing, the ruff, the red-ſhank, the ſand-piper, the ſee-pie, the Norfolk plover, and the ſea-lark, breed, and, for the moſt part, reſide in this country. In ſummer, they frequent ſuch marſhes as are not dried up in any part of the year; the Eſſex-hundreds, and the fens of Lincolnſhire. There, in ſolitudes formed by ſurrounding marſhes, they breed and rear their young. In winter, they come down from their retreats, rendered uninhabitable by the flooding of the waters, and ſeek their food about our ditches and marſhy meadow-grounds. Yet, even of this claſs, all are wanderers upon ſome occaſions, and take wing to the northern climates, to breed, and find ſubſiſtence. This happens when our ſummers are very dry, and when the fenny countries are not ſufficiently watered to defend their retreats.

As all theſe birds run and feed upon the ground, ſo they are all found to neſtle there. The number of eggs generally to be ſeen in every neſt, is from two to four; never more, and very ſeldom fewer. The neſt is made without any art; but the eggs are either laid in ſome little depreſſion of the earth, or on a few bents and long graſs, that ſcarcely preſerve them from the moiſture below.

The lapwing and the plover are often ſeen to fight among themſelves; but there is one little bird of this tribe, called the ruff, that has got the epithet of the fighter. In the beginning of the ſpring, when theſe birds arrive among our marſhes, they are obſerved to engage, with deſperate fury, againſt each other. It is then that the fowlers, ſeeing them intent on mutual deſtruction, ſpread their nets over them, and take them in great numbers: yet, even in captivity, their animoſity ſtill continues. The people that fat them up for ſale, are obliged to ſhut them up in cloſe, dark rooms; for, if they let ever ſo little light in among them, the turbulent priſoners inſtantly fight with each other, and never ceaſe till each has killed its antagoniſt, eſpecially, ſays Willoughby, if any body ſtands by. A ſimilar animoſity, though in leſs degree, prompts all this tribe; but when they have paired, and begun to lay, their contentions are over.

The place theſe birds chiefly chuſe to breed in, is in ſome iſland ſurrounded with ſedgy moors, where men ſeldom reſort; and in ſuch ſituations I have often ſeen the ground ſo ſtrewed with eggs and neſts, that one could ſcarce take a ſtep without breaking ſome of them. The arts of the lapwing to allure men or dogs from her neſt, are perfectly amuſing. When ſhe perceives the enemy approach, ſhe never waits till they arrive at her neſt, but boldly runs to meet them. When ſhe has come as near them as ſhe dares, ſhe then raiſes with a loud ſcreaming before them, ſeeming as if ſhe were juſt fluſhed from hatching; while ſhe is then probably a hundred yards from her neſt. Thus ſhe flies, with great clamour and anxiety, whining and ſcreaming round the invaders, ſtriking at them with her wings, and fluttering as if ſhe were wounded.

The Water-Hen, and the Coot.

The water-hen, and the coot, have too near an affinity to one another, not to be ranked in the ſame deſcription. They are ſhaped entirely alike: their legs are long, and their thighs are partly bare: their necks are proportionable, their wings ſhort, their bills ſhort and weak, their colour black, their foreheads bald and without feathers, and their habits entirely the ſame. The water-hen weighs only fifteen ounces; but the coot weighs twenty-four. The bald part of the forehead in the coot is black; in the water-hen it is of a beautiful pink colour. The toes of the water-hen are edged with a ſtraight membrane; thoſe of the coot have it ſcolloped and broader.

Birds of the crane kind are furniſhed with long wings, and eaſily change place. The water-hen, on the other hand, whoſe wings are ſhort, is obliged to reſide near the ſide of the pond or the river in which ſhe ſeeks for proviſion. She builds her neſt upon low trees and ſhrubs, of ſticks and fibres, by the water ſide. She lays twice or thrice in a ſummer. Her young ſwim the moment they leave the egg, purſue their parent, and imitate all her manners. She rears, in this manner, two or three broods in a ſeaſon; and when the young are grown up, ſhe drives them off, to ſhift for themſelves.

As the coot is a larger bird, it is always ſeen in larger ſtreams, and more remote from mankind. It there makes a neſt of ſuch weeds as the ſtream affords, and lays them among the reeds, floating on the ſurface, and riſing and falling with the water. The reeds among which it is built, keep it faſt; ſo that it is ſeldom waſhed into the middle of the ſtream. But if this happen, which is ſometimes the caſe, the bird ſits in her neſt, like a mariner in his boat, and ſteers, with her legs, her cargo into the neareſt harbour. There, having attained her port, ſhe continues to ſit in great tranquillity, regardleſs of the impetuoſity of the current; and, though the water penetrates her neſt, ſhe hatches her eggs in that wet condition.

To theſe birds with long legs and finny toes, I will add one ſpecies more, with ſhort legs and finny toes: I mean the Grebe. It is much larger than either of the former, and its plumage is white and black. It differs alſo entirely in the ſhortneſs of its legs, which are made for ſwimming, and not for walking. In fact, they are, from the knee upward, hid in the belly of the bird, and have conſequently very little motion. By this mark, and by the ſcollopped fringe of the toes, this bird may be eaſily diſtinguiſhed from all others.

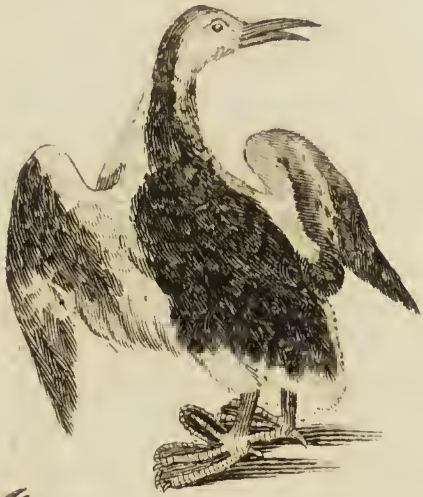
As, from the ſhortneſs of their wings, they are ill formed for flying, and from the uncommon ſhortneſs of their legs, quite unfit for walking, they ſeldom leave the water. And they chiefly frequent thoſe broad, ſhallow pools where their faculty of ſwimming can be turned to the beſt advantage, in fiſhing and ſeeking their prey.

In this country, they chiefly frequent the mres of Shropſhire and Cheſhire; where they breed among the reeds and flags, in a floating neſt. It is never ſeen on land; and, though diſturbed ever ſo often, will not leave that lake where alone, by diving and ſwimming, it can find food and ſecurity. It is chiefly ſought for the ſkin of its breaſt, the plumage of which is of a moſt beautiful ſilvery white, and as gloſſy as ſatin.

CHAP.

Plate 31.

The Grebe.



The Avoſetta.

The Puffin *or* Coulterneb.

The Pelican.

J. Fraſer sc.

CHAP. XXVIII.

OF WATER-FOWL—THE PELICAN—THE ALBATROSS—THE CORMORANT—THE SOLAND GOOSE—THE GULL—THE PETREL—THE PENGUIN—THE DIVER—THE AUK—THE GUILLIMOT—THE PUFFIN—THE GOOSEANDER—THE SWAN—THE GOOSE—THE BARNACLE—THE BRENT GOOSE—THE DUCK—THE EIDER DUCK—THE SCHOOTER—THE SHELDRAKE—THE POCHARD—THE WIDGEON—THE TEAL—THE MUSCOVY DUCK, &C.—OF DECOYS FOR TAKING DUCKS—THE KING FISHER.

The Pelican.

THE Pelican of Africa is much larger than a ſwan, and ſomewhat of the ſame ſhape and colour. Its four toes are all webbed together; and its neck, in ſome meaſure, reſembles that of a ſwan. It differs however, from all other birds, in the bill, and the great pouch underneath, which are wonderful, and demand a diſtinct deſcription. This enormous bill is fifteen inches from the point to the opening of the mouth, which is a good way back behind the eyes. The baſe of the bill is ſomewhat greeniſh; but it varies towards the end, being of a reddiſh blue. To the lower edges of the under-chap, hangs a bag, reaching the whole length of the bill to the neck, which is ſaid to be capable of containing fifteen quarts of water. This bag the bird has a power of wrinkling up into the hollow of the under-chap; but, by opening the bill, and putting one's hand down into the bag, it may be diſtended at pleaſure. It is not covered with feathers, but with a ſhort downy ſubſtance, as ſmooth and as ſoft as ſatin. Tertre affirms, that this pouch will contain as many fiſh as will ſerve ſixty hungry men for a meal. Such is the formation of this extraordinary bird, which is a native of Africa and America. It was once alſo known in Europe, particularly in Ruſſia; but it ſeems to have deſerted our coaſts.

The pelicans are of an aſh-colour. They are torpid to the laſt degree, and nothing can exceed their indolence but their gluttony. It is only from the ſtimulations of hunger, that they are excited to labour; for otherwiſe they would continue always in fixed repoſe. When they have raiſed themſelves about thirty or forty feet above the ſurface of the ſea, they turn their head, with one eye downwards, and continue to fly in that poſture. As ſoon as they perceive a fiſh ſufficiently near the ſurface, they dart down upon it with the ſwiftneſs of an arrow, ſeize it with unerring certainty, and ſtore it up in their pouch. They then riſe again, though not without great difficulty, and continue hovering and fiſhing, with their head on one ſide, as before.

They continue this work, with great effort and induſtry, till their bag is full; and then they fly to land, to devour and digeſt at leiſure, the fruits of their induſtry. Towards night, they have another hungry call; and they muſt again go to labour. Their life is ſpent between ſleeping and eating; and they are as foul as they are voracious, as they are every moment voiding excrements. The female makes no preparation for her neſt, nor ſeems to chuſe any place in preference to lay in, but drops her eggs on the bare ground, to the number of five or ſix, and there continues to hatch them. Their fleſh is uſeleſs.

With all the ſeeming indolence of this bird, it is not entirely incapable of inſtruction in a domeſtic ſtate. Father Raymond aſſures us, that he has ſeen one ſo tame and well educated among the native Americans, that it would go off in the morning, at the word of command, and return before night to its maſter, with its great paunch diſtended with plunder; a part of which the ſavages would make it diſgorge, and a part they would permit it to reſerve for itſelf. "The pelican," as Faber relates, "is not deſtitute of other qualifications. One of thoſe which was brought alive to the Duke of Bavaria's court, where it lived forty years, ſeemed to poſſeſs very uncommon ſenſations. It was much delighted in the company and converſation of men, and in muſic, both vocal and inſtrumental. It would willingly ſtand," ſays he "by thoſe that ſung or ſounded the trumpet; and, ſtretching out its head, and turning its ear to the muſic, would liſten very attentively to its harmony, though its own voice was little better than the braying of an aſs."

Geſner tells us, that the emperor Maximilian had a tame pelican which lived above eighty years, and which always attended his army on their march.

The Albatroſs.

The albatroſs is one of the largeſt and moſt formidable birds of Africa and America. Its body is rather larger than that of a pelican; and its wings, when extended, are ten feet from the tip of the one to that of the other. The bill, which is ſix inches long, is yellowiſh, and terminates in a crooked point. The top of the head is of a bright brown; the back is of a dirty deep ſpotted brown; and the belly and the parts under the wings are white. The toes, which are webbed, are of a fleſh colour.

This bird is an inhabitant of the tropical climates, and alſo beyond them, as far as the Streights of Magellan, in the South Seas. It not only eats fiſh, but alſo ſuch ſmall water-fowl as it can take by ſurprize. It preys, as all the gull kind do, upon the wing, and chiefly purſues the flying fiſh that are forced from the ſea by the dolphins.

The albatroſs ſeems to have a peculiar affection for the penguin, and a pleaſure in its ſociety. They are always ſeen to chuſe the ſame places of breeding; ſome diſtant, uninhabited iſland, where the ground ſlants to the ſea, as the penguin is not formed either for flying or climbing. In ſuch places their neſts are ſeen together, as if they ſtood in need of mutual aſſiſtance and protection. In the middle, on high, the albatroſs raiſes its neſt, on heath ſticks and long graſs, about two feet above the ſurface. Round this again the penguins make their lower ſettlements, rather in holes in the ground; and moſt uſually there are eight penguins for one albatroſs.

The Cormorant.

The Cormorant is about the ſize of a large Muſcovy duck, and may be diſtinguiſhed from all other birds of this kind, by its four toes being united by membranes together; and by the middle toe bing toothed or notched, like a ſaw, to aſſiſt it in holding its fiſhy prey. The head and neck of this bird are of a ſooty black; and the body thick and heavy, more inclining in figure to that of the gooſe than the gull. As ſoon as the winter approaches, they are ſeen diſperſed along the ſea-ſhore, and aſcending up the mouths of freſh-water rivers, carrying deſtruction to all the finny tribe. They are moſt remarkably voracious, and have a moſt ſudden digeſtion. Their appetite is for ever craving, and never ſatisfied. This gnawing ſenſation may probably be increaſed by the great quantity of ſmall worms that fill their inteſtines, and which their inceſſant gluttony contributes to engender.

This bird has the moſt rank and diſagreeable ſmell, and is more fœtid than even carrion, itſelf. It is ſeen as well by land as ſea; it fiſhes in freſh-water lakes, as well as in the depths of the ocean. It builds in the cliffs of rocks, as well as on trees; and preys not only in the day-time, but by night.

Its indefatigable nature, and its great power in catching fiſh, were probably the motives that induced ſome nations to tame this bird, for the purpoſes of fiſhing. The deſcription of their manner of fiſhing is thus delivered by Faber. "When they carry them out of the rooms where they are kept, to the fiſh-pools, they hood-wink them, that they may not be frightened by the way. When they arrive at the rivers, they take off their hoods; and having tied a leather thong round the lower part of their necks, that they may not ſwallow down the fiſh they catch, they throw them into the river. They preſently dive under water, where, for a long time, with wonderful ſwiftneſs, they purſue the fiſh; and when they have caught them, riſe to the top of the water, and preſſing the fiſh lightly with their bills, ſwallow them; till each bird hath, after this manner, devoured five or ſix fiſhes. Then their keepers call them to the fiſt, to which they readily fly; and, one after another vomit up all their fiſh, a little bruiſed with the nip given in catching them. When they have done fiſhing, they ſet the birds on ſome high place, looſe the ſtring from their necks, leaving the paſſage to the ſtomach free and open; and, for their reward, they throw them part of their prey; to each one or two fiſhes, which they will catch moſt dexterouſly, as they are falling in the air." At preſent, the cormorant is trained up in every part of China for the ſame purpoſe. "It is very pleaſant to ſee with what ſagacity they portion out the lake or the canal where they are upon duty. When they have found their prey, they ſeize it with their beak by the middle, and carry it without fail to their maſter. When the fiſh is two large, they mutually aſſiſt each other. One ſeizes it by the head, the other by the tail, and in this manner carry it to the boat together. They have always, while they fiſh, a ſtring faſtened round their throats, to prevent them from devouring their prey."

The Gannet, or Soland Gooſe.

The Gannet, or Soland Gooſe, is of the ſize of a tame gooſe, but its wings are much longer, being ſix feet over. The bill is ſix inches long, ſtraight almoſt to the point. It differs from the cormorant in ſize, being larger; in its colour, which is chiefly white; and by having no noſtrils, but in their place a long furrow that reaches almoſt to the end of the bill. From the corner of the mouth is a narrow ſlip of black bare ſkin, that extends to the hinder part of the head. Beneath the ſkin is another that, like the pouch of the pelican, is dilatable, and of ſize ſufficient to contain five or ſix entire herrings, which in the breeding ſeaſon it carries at once to its mate or its young.

Theſe birds, which ſubſiſt entirely upon fiſh, chiefly reſort to thoſe uninhabited iſlands where their food is found in plenty, and where men ſeldom diſturb them. The iſlands to the north of Scotland, the Skelig iſlands off the coaſts of Kerry, in Ireland, and thoſe that lie in the north ſea off Norway, abound with them. But it is on the Baſs iſland, in the Firth of Forth where they are ſeen in the greateſt abunance. "It is ſcarcely poſſible to walk there without treading on them: the flocks of birds upon the wing, are ſo numerous, as to darken the air like a cloud; and their noiſe is ſuch, that one cannot, without difficulty, be heard by the perſon next to him."

The gannet is a bird of paſſage. In winter it ſeeks the more ſouthern coaſts of Cornwall, hovering over the ſhoals of herrings and pilchards which in that ſeaſon come down from the northern ſeas. Its firſt appearance in the northern iſlands is in the beginning of ſpring; and it continues to breed till the end of ſummer. But, in general, its motions are determined by the migrations of the immenſe ſhoals of herrings that come pouring down at that ſeaſon through the Britiſh Channel, and ſupply all Europe as well as this bird with their ſpoil. The gannet aſſiduouſly attends the ſhoal in their paſſage, keeps with them in their whole circuit round our iſland, and ſhares with our fiſhermen this exhauſtleſs banquet. As it is ſtrong of wing, it never comes near the land; but is conſtant to its prey. The young gannet is reckoned a great dainty in Scotland, and ſells very high.

The Gull.

The Gull, and all its varieties, is very well known in every part of the kingdom. With a ſlow-ſailing flight it hovers over rivers, to prey upon the ſmaller kinds of fiſh: it follows the plowman in fallow fields to pick up inſects; and when living animal food does not offer, it contents itſelf with carrion and whatever elſe of the kind it can fall in with. Gulls are found in great plenty in every place; but it is chiefly round our rockieſt ſhores that they are ſeen in the greateſt abundance. It is there that the gull breeds and brings up its young: it is there that millions of them are heard ſcreaming with diſcordant notes for months together.

Thoſe who are acquainted with our coaſts know that there are two different kinds of ſhores; that which ſlants down to the water with a gentle declivity, and that which riſes with a precipitate boldneſs, and ſeems ſet as a bulwark to repel the force of the invading deeps. It is to the laſt ſort of ſhores that the whole tribe of the gull-kind reſort, as the rocks afford them a retreat for their young, and the ſea a ſufficient ſupply.

Theſe birds, like all others of the rapacious kind, lay but few eggs; and hence, in many places, their number is daily ſeen to diminiſh. Moſt of the kind are fiſhy taſted, with black ſtringy fleſh. The young ones however, are better food; and of theſe, with ſeveral other birds of the penguin kind, the poor inhabitants of our northern iſlands make their wretched banquets. They have been long uſed to no other food; and even ſalted gull can be reliſhed by thoſe who know no better. Of the gull ſpecies there are more than twenty different kinds; of the PETREL three, and of the ſea-ſwallow the ſame number. They have all nearly the ſame habits, the ſame nature, and are caught in the ſame manner, either by covering their neſts with a net, or by ſtriking them with a pole as they fly out of their holes.

The Penguin.

The Penguin is but ill fitted for flight, and ſtill leſs for walking. The largeſt of this kind, indeed, which have a thick, heavy body to raiſe, cannot fly at all. Their wings ſerve them rather as paddles to help them forward, when they attempt to move ſwiftly; and in a manner walk along the ſurface of the water. Even the ſmaller kinds ſeldom fly by choice. They flutter their wings with the ſwifteſt efforts without making way; and though they have but a ſmall weight of body to ſuſtain, yet they ſeldom venture to quit the water where they are provided with food and protection.

As the wings of the penguin tribe are not fit for flight, their legs are ſtill more awkwardly adapted for walking. This whole tribe have all above the knee hid within the belly; and nothing appears but two ſhort legs, or feet, as ſome would call them, that ſeem ſtuck under the rump and upon which the animal is very awkwardly ſupported. They ſeem, when ſitting or attempting to walk, like a dog that has been taught to ſit up, or to move a minuet. Their ſhort legs drive the body in progreſſion from ſide to ſide; and were they not aſſiſted by their wings, they could ſcarcely move faſter than a tortoiſe.

This awkward poſition of the legs, which ſo diſqualifies them for living upon land, adapts them admirably for a reſidence in water. For in water, the legs placed behind the moving body, puſhes it forward with greater velocity; and theſe birds, like Indian canoes, are the ſwifteſt in the water, by having their paddles in the rear.

As they never viſit land, except when they come to breed, their feathers take a colour from their ſituation. That part of them which has been continually bathed in the water, is white; while their backs and wings are of different colours, according to the different ſpecies. They are alſo covered more warmly all over the body with feathers, than any other birds whatever; ſo that the ſea ſeems entirely their element.

The Magellanic Penguin, in ſize, approaches near that of a tame gooſe. They walk erect with their heads on high, their fin-like wings hanging down like arms. To ſee them therefore, at a diſtance, they look like ſo many children with white aprons. Hence they are ſaid to unite in themſelves the qualities of men, fowls, and fiſhes. Like men, they are upright; like fowls they are feathered; and like fiſhes, they have fin-like inſtruments, that beat the water before, and ſerve for all the purpoſes of ſwimming rather than of flying.

They feed upon fiſh; and ſeldom come aſhore, except in the breeding ſeaſon. Their fleſh is rank and fiſhy; though our ſailors ſay, that *it is pretty good eating.* In ſome the fleſh is ſo tough, and the feathers ſo thick, that they ſtand the blow of a ſcymitar without injury.

The penguin lays but one egg; and in frequented ſhores, is found to burrow like a rabbit. Sometimes three or four take poſſeſſion of one hole, and hatch their young together. The egg of the penguin, as well as of all this tribe, is very large for the ſize of the bird, being generally found bigger than that of a gooſe. But as there are many varieties of the penguin, and as they differ in ſize, from that of a Muſcovy duck to a ſwan, the eggs differ in the ſame proportion.

The Auk, Puffin, and other birds of the Penguin Kind.

Of a ſize far inferior to the penguin, but with nearly the ſame form, and exactly of the ſame appetites and manners, there is a very numerous tribe,

tribe. The firſt of theſe is the Great Northern Diver, which is nearly of the ſize of a gooſe. It is beautifully variegated all over with many ſtripes, and differs from the penguin, in being much ſlenderer and more elegantly formed. The Grey Speckled Diver does not exceed the ſize of a Muſcovy duck; and, except in ſize, greatly reſembles the former. The Auk breeds on the iſland of St Kilda, and chiefly differs from the penguin in ſize and colour. It is ſmaller than a duck; and the whole of the breaſt and belly, as far as the middle of the throat, is white. The Guillemot is about the ſame ſize; and it differs from the auk, in having a longer, a ſlenderer, and a ſtraighter bill. The Scarlet Throated Diver may be diſtinguiſhed by its name; and the Puffin or Coulter-neb, is one of the moſt remarkable birds we know.

Words cannot eaſily deſcribe the form of the bill of the puffin, which differs ſo greatly from that of any other bird. Thoſe who have ſeen the coulter of a plough, may form ſome idea of the beak of this odd-looking animal. It is flat; but, very different from that of the duck, its edge is upwards. It is of a triangular figure, and ending in a ſharp point. It is of two colours; aſh coloured near the baſe, and red towards the point. It has three furrows or grooves impreſſed in it; one in the livid part, two in the red. The eyes are fenced with a protuberant ſkin, of a livid colour; and they are grey or aſh-coloured.

The puffin, like all the reſt of this kind, has its legs thrown ſo far back, that it can hardly move without tumbling. This makes it riſe with difficulty, and ſubject to many falls before it gets upon the wing; but as it is a ſmall bird, not much bigger than a pigeon, when it once riſes, it can fly with great ſwiftneſs.

Both this and all the former build no neſt; but lay their eggs either in the crevices of rocks, or in holes under ground near the ſhore. They prefer the latter ſituation; for the puffin, the auk, the guillemot, and the reſt, cannot eaſily riſe to the neſt when in a lofty ſituation.

All the winter theſe birds viſit regions too remote for diſcovery. At the latter end of March, or the beginning of April, come over a troop of their ſpies or harbingers, that ſtay two or three days, as it were to ſearch out for their former ſituations, and ſee whether all be well. This done they once more depart; and, about the beginning of May, return again with all their companions. But if the ſeaſon happen to be ſtormy and tempeſtous; and the ſea troubled, the unfortunate voyagers undergo incredible hardſhips; and they are found, by hundreds, caſt away upon the ſhores, emaciated and periſhed with famine.

When the puffin prepares for breeding, which always happens a few days after its arrival, it begins by ſcraping up an hole in the ground not far from the ſhore. And when it has penetrated the earth a little, it then throws itſelf upon its back, and with bill and claws thus burrows inward, till it has dug a hole with ſeveral windings and turnings, from eight to ten feet deep. It particularly ſeeks to dig under a ſtone, where it expects the greateſt ſecurity. In this fortified retreat it lays one egg; which, though the bird be not much bigger than a pigeon, is of the ſize of a hen's.

Few birds or beaſts will venture to attack them in their retreats. When the great ſea-raven comes to take away their young, the puffins boldly oppoſe him. Their meeting affords a moſt ſingular combat. As ſoon as the raven approaches, the puffin catches him under the throat with its beak, and ſticks its claws into his breaſt. This makes the raven, with a loud ſcreaming, attempt to get away; but the little bird ſtill holds faſt to the invader, nor lets him go till they both come to the ſea, where they drop down together, and the raven is drowned. Yet the raven is but too often ſucceſsful; and invading the puffin at the bottom of its hole, devours both the dam and its young.

The Gooſeander.

The gooſeander is a bird with the body and wing ſhaped like thoſe of the penguin kind, but with legs not hid in the belly. It may be diſtinguiſhed from all others by its bill, which is round, hooked at the point, and toothed, both upper and under chap, like a ſaw. Its colours are various and beautiful. Its manners and appetites, however, entirely reſemble thoſe of the diver. It feeds upon fiſh, for which it dives; and it is ſaid to build its neſt upon trees, like the heron and the cormorant. It ſeems to form the ſhade between the penguin and the gooſe kind; having a round bill, like the one; and unembarraſſed legs, like the other. In the ſhape of the head, neck, and body, it reſembles them both.

The Swan, the Gooſe, and the Duck.

Though theſe birds do not reject animal food when offered them, yet they can ſubſiſt upon vegetables, and ſeldom ſeek any other. They are eaſily provided for; wherever there is water. All the other web-footed tribes are continually voracious, continually preying. Theſe lead more harmleſs lives. The weeds on the ſurface of the water, or the inſects at the bottom, the graſs by the bank, or the fruits and corn in cultivated grounds, are ſufficient to ſatisfy their eaſy appetites.

They breed in great abundance, and lead their young to the pool the inſtant they are excluded.

As their food is ſimple, ſo their fleſh is nouriſhing and wholeſome. The ſwan was conſidered as a high delicacy among the ancients; the gooſe was abſtained from as totally indigeſtible. Modern manners have inverted taſtes; the gooſe is now become the favourite; and the ſwan is ſeldom brought to table unleſs for the purpoſes of oſtentation. But at all times the fleſh of the duck was in high eſteem: the ancients thought even more highly of it than we do. We are contented to eat it as a delicacy: they alſo conſidered it as a medicine; and Plutarch aſſures us, that Cato adminiſtered duck to his family, whenever they happened to be indiſpoſed.

No bird makes a more indifferent figure upon land, or a more beautiful one in the water, than the *Swan*. This fine bird has long been rendered domeſtic. The wild ſwan, though ſo ſtrongly reſembling this in colour and form, is very differently formed within. The wild ſwan is leſs than the tame almoſt a fourth; for as the one weighs twenty pounds, the other only weighs ſixteen pounds and three quarters. The colour of the tame ſwan is all white; that of the wild bird is, along the back and the tips of the wings, of aſh-colour. But theſe are ſlight differences, compared to what are found upon diſſection.

This beautiful bird is as delicate in its appetites, as elegant in its form. Its chief food is corn, bread, water-herbs, and roots and ſeeds, which are found near the margin. It prepares a neſt in ſome retired part of the bank, and chiefly where there is an iſlet in the ſtream. It is compoſed of water-plants, long graſs, and ſticks. The ſwan lays ſeven or eight eggs, white, much larger than thoſe of a gooſe, with a hard ſhell. It ſits near two months before its young are excluded; which are aſh-coloured when they firſt leave the ſhell, and for ſome months after.

All the ſtages of this bird's approach to maturity are ſlow, and ſeem to mark its longevity. It is two months in hatching; a year in growing to its proper ſize. The ſwan is ſaid to be remarkable for its longevity. A gooſe has been known to live an hundred years; and the ſwan, from its ſuperior ſize, and from its harder, firmer fleſh, may naturally be ſuppoſed to live ſtill longer.

The Gooſe.

The gooſe, in its domeſtic ſtate, exhibits a variety of colours. The wild gooſe always retains the ſame marks: the whole upper part is aſh-coloured: the breaſt and belly are of a dirty white: the bill is narrow at the baſe, and at the tip it is black. The legs are of a ſaffron colour, and the claws are black.

The wild gooſe is ſuppoſed to breed in the northern parts of Europe; and, in the beginning of winter, to deſcend into more temperate regions. If they come to the ground by day, they range themſelves in a line, like cranes; and ſeem rather to have deſcended for reſt, than for any other purpoſe. When they have ſat in this manner for an hour or two, I have heard one of them, with a loud long note, ſound a kind of charge, to which the reſt punctually attended, and they purſued their journey with renewed alacrity. Their flight is very regularly arranged. They either go in a line a breaſt, or in two lines, joining in an angle in the middle.

The Barnacle.

The barnacle differs in ſome reſpects from both theſe; being leſs than either, with a black bill, much ſhorter than either of the preceding. It is ſcarce neceſſary to combat the idle error of this bird being bred from a ſhell ſticking to the bottom of ſhips. It is well known to be hatched from an egg, in the ordinary manner, and to differ in very few particulars from all the reſt of its kind.

The Brent Gooſe.

The brent gooſe is ſtill leſs than the former, and not bigger than a Muſcovy duck, except that the body is longer. The head, neck, and upper part of the breaſt, are black. About the middle of the neck, on each ſide, are two ſmall ſpots or lines of white, which together appear like a ring.

The Tame Duck.

The tame duck is the moſt eaſily reared of all our domeſtic animals. The wild duck differs, in many reſpects, from the tame; and in them there is ſtill greater variety than among the domeſtic kinds. Of the tame duck there are not leſs than ten different ſorts; and of the wild, Briſſon reckons above twenty. The moſt obvious diſtinction between wild and tame ducks is in the colour of their feet; thoſe of the tame duck being black; but thoſe of the wild one yellow. The difference between wild ducks among each other, ariſes as well from their ſize as the nature of the place they feed in. Sea-ducks, which feed in the ſalt-water, and dive much, have a broad bill, bending upwards, a large hind toe, and a long blunt tail. Pond-ducks, which feed in plaſhes, have a ſtraight and narrow bill, a ſmall hind toe, and a ſharp pointed train. The former are called, by our decoy-men, foreign ducks; the latter are ſuppoſed to be natives of England. In this tribe, we may rank, as natives of our own European dominions, the *Eider Duck*, which is twice the ſize of a common duck, with a black bill. We may alſo rank the *Velvet Duck*, with a yellow bill; the *Scoter*, with a knob at the baſe of a yellow bill; the *Tufted Duck*, adorned with a thick creſt; the *Scaup Duck*, leſs than the common Duck, with the bill of a greyiſh blue colour; the *Golden Eye*, with a large white ſpot at the corners of the mouth, reſembling an eye; the *Sheldrake*, with the bill of a bright red, and ſwelling into a knob; the *Mallard*, which is the ſtock whence our tame breed has probably been produced. It may not be improper to claſs with theſe, the *Pintail*, with the two middle feathers of the tail three inches longer than the reſt; the *Pochard*, with the head and neck of a bright bay; the *Widgeon*, with a lead coloured bill, and the plumage of the back marked with narrow black and white undulated lines, but beſt known by its whiſtling ſound. Laſtly, we may add the *Teal*, which is the ſmalleſt of this kind, with the bill black, the head and upper part of the neck of a bright bay. Theſe are the moſt common birds of the duck kind among ourſelves; but who can deſcribe the amazing variety of this tribe, if he extends his view to the different quarters of the world? The moſt diſtinguiſhed of the foreign tribe are, the *Muſcovy Duck*, or, more properly ſpeaking, the Muſk Duck, a native of Africa, ſo called from a ſuppoſed muſky ſmell, with naked ſkin round the eyes. The *Braſilian Duck*, which is of the ſize of a gooſe, all black except the tips of the wings. The *American Wood Duck*, with a variety of beautiful colours, and a plume of feathers which falls from the back of the head like a friar's cowl. Theſe, and many more, might be added, were increaſing the number of names the way to enlarge the ſphere of our knowledge.

All theſe live in the manner of our domeſtic ducks, keeping together in flocks in the winter, and flying in pairs in ſummer, rearing their young by the water-ſide, and leading them to their food as ſoon as out of the ſhell. Their neſts are uſually built among heath or ruſhes, not far from the water; and they lay twelve, fourteen, or more eggs before they ſit; yet this is not always their method. The dangers they continually encounter from their ſituation, ſometimes obliges them to change their manner of building; and their awkward neſts are often ſeen exalted on the tops of trees. This muſt be a very great labour to perform, as the duck's bill is but ill-formed for building a neſt, and giving the materials of which it is compoſed a ſufficient ſtability to ſtand the weather. The neſt, whether high or low, is generally compoſed of the longeſt graſs, mixed with heath, and is lined within with the bird's own feathers. The eider duck is particularly remarkable for the warmth of its neſt. This bird, which, as was ſaid, is above twice as large as the common duck, and reſides in the colder climates, lays from ſix to eight eggs, making her neſt among the rocks or the plants along the ſea-ſhore. The external materials of the neſt are ſuch as are common with the reſt of the kind; but the inſide lining, on which the eggs are immediately depoſited, is at once the ſofteſt, warmeſt, and the lighteſt ſubſtance with which we are acquainted. This is no other than the inſide down which covers the breaſt of the bird in the breeding ſeaſon. This the female plucks off with her bill, in order to line the inſide of her neſt. The natives watch the place where ſhe begins to build, and ſuffering her to lay, take away both the eggs and the neſt. The duck, however, not diſcouraged by the firſt diſappointment, builds and lays in the ſame place a ſecond time, which they take away in the ſame manner. The third time ſhe builds, the drake muſt ſupply the down from his breaſt to line the neſt with: and, if this be robbed, they both forſake the place, and breed there no more. This down the natives take care to ſeparate from the dirt and moſs with which it is mixed; and, though no people ſtand in more need of a warm covering than themſelves, yet their neceſſities compel them to ſell it to the more indolent and luxurious inhabitants of the ſouth, for brandy and tobacco.

As theſe animals poſſeſs the faculties of flying and ſwimming, ſo they are in general birds of paſſage, and it is moſt probable that they perform their journies acroſs the ocean as well on the water as in the air. Thoſe that migrate to this country, on the approach of winter, are ſeldom found ſo well taſted or ſo fat as the fowls that continue with us the year round. Their fleſh is often lean, and ſtill oftener fiſhy; which flavour it has probably contracted in the journey, as their food in the lakes of Lapland, whence they deſcend, is generally of the inſect kind.

As ſoon as they arrive among us, they are generally ſeen flying in flocks to make a ſurvey of thoſe lakes where they intend to take up their reſidence for the winter. Lakes, with a marſh on one ſide, and a wood on the other, almoſt always abound with wild fowl. The greateſt quantities are taken in decoys; which, though well known near London, are yet untried in the remoter parts of the country. The manner of making and managing a decoy is as follows:

A place is to be choſen for this purpoſe far remote from the common highway, and all noiſe of people. When the place is choſen, the pool, if poſſible, is to be planted round with willows, unleſs a wood anſwers the purpoſe of ſhading it on every ſide. On the ſouth and north ſide of this pool are two, three, or four ditches or channels, made broad towards the pool, and growing narrower till they end in a point. Theſe channels are to be covered over with nets, ſupported by hooped ſticks bending from one ſide to the other. They therefore, form a vault or arch growing narrower and narrower to the point, where it is terminated by a tunnel-net, like that in which fiſh are caught in weirs. Along the banks of theſe channels ſo netted over, which are called pipes, many hedges are made of reeds ſlanting to the edge of the channel, the acute angles to the ſide next the pool. The whole apparatus alſo is to be hidden from the pool by a hedge of reeds along the brink, behind which the fowler manages his operations. The place being fitted in this manner, the fowler is to provide himſelf with a number of wild ducks tamed, which are called decoys. Theſe are always to be fed at the mouth or entrance of the pipe, and to be accuſtomed to come at a whiſtle.

As ſoon as the evening is ſet in, *the decoy riſes*, as they term it, and the wild fowl feed during the night. If the evening be ſtill, the noiſe of their wings, during their flight, is heard at a very great diſtance, and produces no unpleaſing ſenſation. The fowler, when he finds a fit opportunity, and ſees his decoy covered with fowl, walks about the pool, and obſerves into what pipe the birds gathered in the pool may be enticed. Then caſting hemp-ſeed, or ſome ſuch ſeed as will float on the ſurface of the water, at the entrance and up along the pipe, he whiſtles to his decoy ducks, who inſtantly obey the ſummons, and come to the entrance of the pipe, in hopes of being fed as uſual. Thither alſo they are followed by a whole flock of unſuſpecting wild ones. The wild ducks, therefore, purſuing the decoy ducks, are led into the broad mouth of the channel or pipe, nor have the leaſt ſuſpicion of the man who keeps hidden behind one of the hedges. When they have got up the pipe, however, finding it grow more and more narrow, they begin to ſuſpect danger, and would return back; but they are now prevented by the man, who ſhews himſelf at the broad end below. Thither, therefore, they dare not return; and riſe they cannot, as they are kept by the net above from aſcending. The only way left them, therefore, is the narrow-funnelled net at the bottom; into this they fly, and there they are taken.

It often happens, however, that the wild fowl are in ſuch a ſtate of ſleepineſs or dozing, that they will not follow the decoy ducks. Uſe is then generally made of a dog that is taught his leſſon. He paſſes backward and forward between the reed-hedges, in which there are little holes, both for the decoy man to ſee, and for the little dog to paſs through. This attracts the eye of the wild fowl; which, prompted by curioſity, advance towards this little animal, while he all the time keeps playing among the reeds, nearer and nearer the funnel, till they follow him too far. Sometimes the dog will not attract their attention till a red handkerchief, or ſomething very ſingular, be put about him. The decoy ducks never enter the funnel-net with the reſt, being taught to dive under water as ſoon as the reſt are got in.

To this manner of taking wild fowl in England, I will ſubjoin another ſtill more extraordinary, frequently practiſed in China. Whenever the fowler ſees a number of ducks ſettled in any particular plaſh of water, he ſends off two or three gourds to float among them. Theſe gourds reſemble our pompions; but, being made hollow, they ſwim on the ſurface of the water; and on one pool there are ſometimes twenty or thirty of theſe gourds floating together. The fowls at firſt are a little ſhy; but by degrees they come nearer; and as all birds at laſt grow familar with a ſcare-crow, the ducks gather about the gourds, and amuſe themſelves by whetting their bills againſt them. When the birds are as familiar with them as the fowler could wiſh, he then prepares to deceive them in good earneſt. He hollows out one of them large enough to put his head in; and, making holes to breathe and ſee through, he claps it on his head. Thus accoutred, he wades ſlowly into the water, keeping his body under, and nothing but his head in the gourd above the ſurface; and in that manner moves imperceptibly towards the unwary fowls. At laſt, however, he fairly gets in among them; while they, having been long uſed to ſee gourds, are not the leaſt afraid while the enemy is in the midſt of them, who as ſoon as he approaches a fowl, he ſeizes it by the legs, and draws it in under the water. There he faſtens it under his girdle, and goes to the next, till he has thus loaded himſelf with as many as he can carry off. When he has got his quantity, without ever attempting to diſturb the reſt of the fowls on the pool, he ſlowly moves off again; and in this manner pays the flock three or four viſits in a day. Of all the various artifices for catching fowl, this ſeems likely to be attended with the greateſt ſucceſs.

Of the King-Fiſher.

I will conclude this hiſtory of birds, with one that ſeems to unite in itſelf ſomewhat of every claſs preceding.

The king fiſher is not much larger than a ſwallow: its ſhape is clumſy: the legs are diſproportionably ſmall, and the bill diſproportionably long. It is two inches from the baſe to the tip: the upper chap is black, and the lower yellow; but the colours of this bird atone for its inelegant form. The crown of the head and the covers of the wings are of a deep blackiſh green, ſpotted with bright azure: the back and tail are of the moſt reſplendent azure: the whole under ſide of the body is orange coloured: a broad mark of the ſame paſſes from the bill beyond the eyes; beyond which is a large white ſpot. The tail is ſhort, and conſiſts of twelve feathers of a rich deep blue: the feet are of a reddiſh yellow, and the three joints of the outmoſt toe adhere to the middle toe, while the inner toe adheres only by one.

From the diminutive ſize, the ſlender ſhort legs, and the beautiful colours of this bird, no perſon would ſuppoſe it one of the moſt rapacious animals that ſkims the deep. Yet it is for ever on the wing, and feeds on fiſh, which it takes in ſurpriſing quantities, when we conſider its ſize and figure. It chiefly frequents the banks of rivers, and takes its prey after the manner of the oſprey, balancing itſelf at a certain diſtance above the water for a conſiderable ſpace, then darting into the deep, and ſeizing the fiſh with inevitable certainty. While it remains ſuſpended in the air, in a bright day, its plumage exhibits a beautiful variety of the moſt dazzling and brilliant colours.

The king-fiſher builds its neſt by the river ſide in a hole which it burrows out itſelf, or in the deſerted hole of a rat. In theſe holes, which, from the remains of fiſh brought there, are very fœtid, the king-fiſher is often found with from five eggs to nine. There the female continues to hatch even though diſturbed; and though the neſt be robbed, ſhe will again return and lay there. The male, whoſe fidelity exceeds even that of the turtle, brings her large proviſions of fiſh while ſhe is thus employed; and ſhe, contrary to what is uſual with moſt other birds, is found plump and fat at that ſeaſon.

The ancients have had their fables concerning this bird, and ſo have the modern vulgar. It is an opinion generally received among them, that the fleſh of the king-fiſher will not corrupt, and that it will even baniſh all vermin. This has no better foundation than that which is ſaid of it always pointing, when hung up dead, with its breaſt to the north. The only truth which can be affirmed of this bird when killed is, that its fleſh is utterly unfit to be eaten; while its beautiful plumage preſerves its luſtre longer than that of any other bird with which we are acquainted.

C H A P. XXIX.

OF FISHES IN GENERAL—OF CETACEOUS FISHES—THE WHALE—THE SWORD FISH—THE NARWHALE, OR UNICORN—THE SPERMACETI WHALE—THE DOLPHIN—GRAMPUS, PORPESSE, &C.

THE number of fiſh to which we have given names, and with the figure of which at leaſt we are a little acquainted, is, according to Linnæus, above four hundred. The majority of theſe are confined to the ſea, and would expire in the freſh water, though there are a few which annually ſwim up the rivers, to depoſit their ſpawn.

The chief inſtruments of a fiſh's motion are, the fins, which in ſome fiſh are more numerous than in others. The fiſh, in a ſtate of repoſe, ſpreads all its fins, and ſeems to reſt upon its pectoral * and ventral † fins near the bottom. If the fiſh fold up the right pectoral fin, the fiſh inclines to the right ſide; if it fold the left fin, it inclines to that ſide. When the fiſh deſires to have a retrograde motion; ſtriking with the pectoral fins, in a contrary direction, effectually produces it. If the fiſh deſires to turn, a blow from the tail ſends it about; but if the tail ſtrikes both ways, then the motion is progreſſive. In purſuance of theſe obſervations, if the dorſal ‡ and ventral fins be cut off, the fiſh reels to the right and left, and endeavours to ſupply its loſs by keeping the reſt of its fins in conſtant employment. If the right pectoral fin be cut off, the fiſh leans to that ſide; if the ventral fin on the ſame ſide be cut away, then it loſes its equilibrium entirely. When the tail is cut off, the fiſh loſes all motion, and becomes the ſport of the water.

The ſenſes of fiſhes are remarkably imperfect, and, indeed, that of ſight is almoſt the only one which, in general, they may be ſaid to poſſeſs. But this is, in ſome degree, compenſated by their aſtoniſhing longevity, ſeveral ſpecies being known to live for more than an hundred years. Their longevity is ſtill exceeded by their ſingular fecundity: a cod, for inſtance, produces at a birth, above nine milions. The flounder produces at once above a million, and the mackarel five hundred thouſand.

The ſpawn continues in its egg ſtate in ſome fiſhes longer than in others, and this generally in proportion to their ſize. The young of the ſalmon continues in egg from December to April: the carp, three weeks, and the little gold-fiſh, from China, is produced ſtill quicker. The young ſpawn are the prey of all the inhabitants of the water, and ſcarcely one in a thouſand eſcapes.

Such is the general picture of theſe heedleſs and hungry creatures. There are ſome however, in this claſs, living in the waters, that are poſſeſſed of finer organs and higher ſenſations; that have all the tenderneſs of birds or quadrupeds for their young; that nurſe them with conſtant care, and protect them from every injury. Of this claſs are the *Cetaceous* tribe, or the fiſhes of the whale kind. There are others, though not capable of nurſing their young, that bring them alive into the world, and defend them with courage and activity. Theſe are the *Cartilaginous* kinds, or thoſe which have griſtles inſtead of bones. But the regardleſs tribe we have been deſcribing, that leave their ſpawn without any protection, are called the *Spinous* or bony kinds, from their bones reſembling the ſharpneſs of thorns.

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* Thoſe near the gills. † The belly fins. ‡ Back fins.

Of Cetaceous Fiſhes.

This tribe is compoſed of the *Whale* and its varieties, of the *Cachalot*, the *Dolphin*, the *Grampus*, and the *Porpeſſe*. All theſe reſemble quadrupeds in their internal ſtructure, and in ſome of their appetites and affections. Like quadrupeds, they have lungs, a midriff, a ſtomach, inteſtines, liver, ſpleen, bladder, and organs of generation. Their heart alſo reſembles that of quadrupeds, with its partitions cloſed up as in them, and driving red and warm blood in circulation through the body. And to keep theſe parts warm, the whole kind are alſo covered between the ſkin and the muſcles with a thick coat of fat or blubber.

As theſe animals breathe the air, it is obvious that they cannot bear to be long under water. They are conſtrained, therefore, every two or three minutes, to come up to the ſurface to take breath, as well as to ſpout out through their noſtril, for they have but one, that water which they ſucked in while gaping for their prey.

But it is in the circumſtances in which they continue their kind, that theſe animals ſhew an eminent ſuperiority. Other fiſh depoſit their ſpawn, and leave the ſucceſs to accident. Theſe never produce above one young, or two at the moſt; and this the female ſuckles entirely in the manner of quadrupeds, her breaſts being placed, as in the human kind, above the navel. Their tails alſo are different from thoſe of all other fiſh. They are placed ſo as to lie flat on the ſurface of the water; while the other kinds have them, as we every day ſee, erect or edgeways. This flat poſition of the tail enables them to force themſelves ſuddenly to the ſurface of the water to breathe, which they are continually obliged to do.

The Whale.

Of the whale, properly ſo called, there are no leſs than ſeven different kinds; all diſtinguiſhed from each other by their external figure, or internal conformation. The Great Greenland Whale, without a back-fin, and black on the back; the Iceland Whale, without a back-fin, and whitiſh on the back; the New England Whale, with a hump on the back; the Whale with ſix humps on the back; the Fin-fiſh, with a fin on the back near the tail; the Pike-headed Whale, and the Round-lipped Whale. All theſe differ from each other in figure, as their names obviouſly imply. They differ alſo ſomewhat in their manner of living; the fin-fiſh having a larger ſwallow than the reſt; being more active, ſlender, and fierce, and living chiefly upon herrings.

The Great Greenland Whale is the fiſh ſo eagerly ſought after. It is a large heavy animal, and the head alone makes a third of its bulk. It is uſually found from ſixty to ſeventy feet long. The fins on each ſide are from five to eight feet, compoſed of bones and muſcles, and ſufficiently ſtrong to give the great maſs of body which they move, ſpeed, and activity. The tail is about twenty-four feet broad; and, when the fiſh lies on one ſide, its blow is tremendous. The ſkin is ſmooth and black, and, in ſome places, marbled with white and yellow; which, running over the ſurface, has a very beautiful effect.

The outward or ſcarf ſkin of the whale is no thicker than parchment; but this removed, the real ſkin appears, of about an inch thick, and covering the fat or blubber that lies beneath. This is from eight to twelve inches thick; and is, when the fiſh is ſound, of a beautiful yellow. The muſcles lie beneath; and theſe, like the fleſh of quadrupeds, are very red and tough.

The cleft of the mouth is above twenty feet long, which is near one third of the animal's whole length; and the upper jaw is furniſhed with barbs, that lie, like the pipes of an organ, the greateſt in the middle, and the ſmalleſt on the ſides. This is the whale-bone, of which the longeſt ſpars are about eighteen feet. The tongue is almoſt immoveably fixed to the under jaw, having the appearance of one great lump of fat; and, indeed, it fills ſeveral hogſheads with blubber. The eyes are not larger than thoſe of an ox; and when the chryſtalline humour is dried, it does not appear larger than a pea. They are placed towards the back of the head, being the moſt convenient ſituation for enabling them to ſee both before and behind. They are guarded by eye-lids and eye-laſhes, as in quadrupeds; and they ſeem to be very piercing.

Nor is their ſenſe of hearing in leſs perfection; for they are warned, at great diſtances, of any danger preparing againſt them. We have already obſerved, that the ſubſtance, called whale-bone, is taken from the upper jaw of the animal, and is very different from the real bones of the whale. The real bones are hard, like thoſe of great land animals, and are both very porous, and filled with marrow. Two great ſtrong bones ſuſtain the under lip, lying againſt each other in the ſhape of an half-moon. Some of theſe are twenty feet long: they are ſeen in ſeveral gardens ſet up againſt each other, and are uſually miſtaken for the ribs.

The fidelity of theſe animals to each other exceeds even the conſtancy of birds. Some fiſhers, as Anderſon informs us, having ſtruck one of two whales, a male and female, that were in company together, the wounded fiſh made a long and terrible reſiſtance. It ſtruck down a boat with three men in it, with a ſingle blow of the tail, by which all went to the bottom. The other ſtill attended its companion, and lent it every aſſiſtance; till, at laſt, the fiſh that was ſtruck, ſunk under the number of its wounds. Its faithful aſſociate, in the mean time, diſdaining to ſurvive its ill fated companion, with great bellowing, ſtretched itſelf upon the dead fiſh, and ſhared its fate.

The whale goes with young nine or ten months, and is then fatter than uſual, particularly when near the time of bringing forth. The young continue at the breaſt for a year; during which time they are called by the ſailors *ſhort-heads.* They are then extremely fat, and yield above fifty barrels of blubber each. The mother, at the ſame time, is equally lean and emaciated. At the age of two years they are called *ſtunts*, as they do not thrive much immediately after quitting the breaſt: they then yield ſcarce above twenty, or twenty-four, barrels of blubber: from that time forward they are called *ſkull-fiſh*, and their age is wholly unknown. The food of the whale is a ſmall inſect which is ſeen floating in thoſe ſeas, and which Linnæus terms the Meduſa. Theſe inſects are black, and of the ſize of a ſmall bean, and are ſometimes ſeen floating in cluſters on the ſurface of the water. They are of a round form, like ſnails in a box, but they have wings, which are ſo tender that it is ſcarce poſſible to touch them without breaking.

Theſe, however, ſerve rather for ſwimming than flying. They have the taſte of raw muſcles, and have the ſmell of burnt ſugar. Inoffenſive as the whale is, it is not without enemies. There is a ſmall animal, of the ſhell-fiſh kind, called the Whale louſe, that ſticks to its body, as we ſee ſhells ſticking to the foul bottom of a ſhip. This inſinuates itſelf chiefly under the fins; and whatever efforts the great animal makes, it ſtill keeps its hold, and lives upon the fat, which it is provided with inſtruments to arrive at.

The ſword-fiſh, however, is the whale's moſt terrible enemy. "At the ſight of this little animal," ſays Anderſon, "the whale ſeems agitated in an extraordinary manner; bounding from the water as if in conſternation. Wherever it appears, the whale perceives it at a diſtance, and flies from it in the oppoſite direction. I have been myſelf," continues he, "a ſpectator of their terrible encounter. The whale has no inſtrument of defence except the tail; with that it endeavours to ſtrike the enemy; and a ſingle blow taking place, would effectually deſtroy its adverſary. The ſword-fiſh, on the other hand, is as active as the other is ſtrong, and eaſily avoids the ſtroke; then bounding into the air, it falls upon its enemy, and endeavours not to pierce with its pointed beak, but to cut with its toothed edges. The ſea all around is ſoon dyed with blood, from the wounds of the whale; while the enormous animal vainly endeavours to reach its invader, and ſtrikes with its tail againſt the ſurface of the water, making a report at each blow louder than the noiſe of a cannon."

There is ſtill another and more powerful enemy called, by the fiſhermen of New England, the killer. This is itſelf a cetaceous animal, armed with ſtrong and powerful teeth. A number of theſe are ſaid to ſurround the whale, in the ſame manner as dogs get round a bull. Some attack it with their teeth behind; others attempt it before; until, at laſt, the enormous animal is torn down, and its tongue is ſaid to be the only part they devour when they have made it their prey. They are ſaid to be of ſuch great ſtrength, that one of them alone was known to ſtop a dead whale that ſeveral boats were towing along, and drag it from among them to the bottom.

But of all the enemies of theſe enormous fiſhes, man is the greateſt. He alone deſtroys more in a year than the reſt in an age, and actually has thinned their numbers in that part of the world where they are chiefly ſought. For the purpoſe of whale fiſhing a number of large veſſels are fitted out annually from different parts of Europe, and are ſtored with ſix months proviſion. When arrived at the part where the whales are expected to paſs to the ſouthward, they always keep their ſails ſet, and a ſailor is placed at the maſt head, to give information when he ſpies a whale. As ſoon as he diſcovers one, all hands are at work: they fit out their boats, and row to where the whale was ſeen. The harpooner, who is to ſtrike the fiſh, ſtands at the prow of the boat, with an harpoon or javelin in his hand, five or ſix feet long, pointed with ſteel like the barb of an arrow, of a triangular ſhape. As this perſon's place is that of the greateſt dexterity, it is alſo that of the greateſt danger. The whale ſometimes overturns the boat with a blow of its tail, and ſometimes drives againſt it with fury. In general, however, the animal ſeems to ſleep on the ſurface of the water; while the boat is approaching, the harpooner ſtands aloft, and, with his harpoon tied to a cord of ſeveral hundred fathom length, darts it into the animal, and then rows off as faſt as poſſible. It is ſome time before the whale ſeems to feel the blow. The inſtrument has uſually pierced no deeper than the fat, and that being inſenſible, the animal continues for a while motionleſs; but ſoon rouſed from its ſeeming lethargy, as the ſhaft continues to pierce deeper and deeper into the muſcular fleſh, it flies of with amazing rapidity. In the mean time, the harpooon ſticks in its ſide; while the rope, which is coiled up in the boat, and runs upon a ſwivel, lengthens as the whale recedes, but ſtill ſhews the part of the deep to which it has retreated. The cord is coiled up with great care; for ſuch is the rapidity with which it runs off, that if it was but the leaſt checked, as it yields with the animal's retreat, it would infallibly overſet the boat. It ſometimes happens alſo, that the rapidity with which it runs over the ſwivel at the edge of the boat, heats it, and it would take fire, did not a man ſtand continually with a wet mop in his hand, to cool the ſwivel as the cord runs. The whale having dived to a conſiderable depth, remains at the bottom, ſometimes for near half an hour, with the harpoon in its body, and then riſes to take breath, expecting that the danger is paſt. But the inſtant it appears, they are all with their boats ready to receive it, and to dart their harpoons into its body: the animal again dives and again riſes, while they repeat their blows. The ſhip follows in full ſail, like all the reſt, never loſing ſight of the boats, and ready to lend them aſſiſtance. In the mean time, the whole ocean ſeems dyed in blood. Thus they renew their attack, till the whale begins to be quite enfeebled and ſpent, when they plunge their longer ſpears, into various parts of its body, and the enormous animal expires. When it is dead, to prevent it from ſinking, they tie it with a ſtrong iron chain to the ſide of the boat, and either cut it up in pieces, and carry it home in that manner, or extract the oil from the blubber on ſhip-board.

The fleſh of this animal is a dainty to ſome nations; and the ſavages of Greenland, as well as thoſe near the ſouth pole, are fond of it to diſtraction. They eat the fleſh, and drink the oil, which is a firſt-rate delicacy. The finding a dead whale is an adventure conſidered among the fortunate circumſtances of their wretched lives. They make their abode beſide it; and ſeldom remove till they have left nothing but the bones.

Jacobſon tells us that his countrymen of the iſland of Feroe, are very fond of ſalted whale's fleſh. The fat of the head they ſeaſon with bay ſalt, and then hang it up to dry in the chimney. He thinks it taſtes as well as fat bacon; and the lean, which they boil, is, in his opinion, not inferior to beef. I fancy poor Jacobſon would make but an indifferent taſter at one of our city feaſts!

The Narwhal.

The narwhal, or ſea-unicorn is neither ſo large nor ſo fat as the whale. But this great animal is ſufficiently diſtinguiſhed from all others of the deep by its tooth or teeth, which point directly forward from the upper jaw, and are from nine to fourteen feet long. In all the variety of weapons with which Nature has armed her various tribes, there is not one ſo large or ſo formidable as this. This terrible weapon is generally found ſingle; and ſome are of opinion that the animal is furniſhed with but one by nature; but there is at preſent the ſkull of a narwhal at the Stadhouſe at Amſterdam with two teeth. The tooth, or, as ſome are pleaſed to call it, the horn of the narwhal, is as ſtraight as an arrow, about the thickneſs of the ſmall of a man's leg, wreathed in the manner we ſometimes ſee twiſted bars of iron. It tapers to a ſharp point; and is whiter, heavier, and harder than ivory. It ſeems to ſpring from the left ſide of the head directly forward in a ſtraight line with the body; and its root enters into the ſocket above a foot and an half. Notwithſtanding its appointments for combat, theſe long and pointed tuſks, amazing ſtrength, and unmatchable celerity, the narwhal is one of the moſt harmleſs inhabitants of the ocean. It is ſeen conſtantly and inoffenſively ſporting among the other great monſters of the deep, no way attempting to injure them, but pleaſed in their company. The Greenlanders call the narwhal the fore-runner of the whale; for wherever it is, the whale is ſure to follow. This may ariſe as well from the natural paſſion for ſociety in theſe animals, as from both living upon the ſame food, which are the inſects we have already taken notice of. Theſe powerful fiſhes make war upon no other living creature; and, though furniſhed with inſtruments to ſpread general deſtruction, are as innocent and as peaceful as a drove of oxen. The narwhal is much ſwifter than the whale, and would never be taken by the fiſherman but for thoſe very tuſks, which at firſt appear to be its principal defence. Theſe animals, are always ſeen in herds, and whenever they are attacked, they crowd together in ſuch a manner, that they are mutually embarraſſed by their tuſks. By theſe they are often locked together, and are prevented from ſinking to the bottom. It ſeldom happens, therefore, but the fiſhermen make ſure of one or two of the hindmoſt, which very well reward them for their pains.

The Cachalot.

The Cachalot, or generally known by the name of the Spermaceti Whale, has ſeveral teeth in the under jaw, but none in the upper. As there are no leſs than ſeven diſtinctions among whales, ſo alſo there are the ſame number of diſtinctions in the tribe we are deſcribing. This tribe is not of ſuch enormous ſize as the whale, properly ſo called, not being above ſixty feet long and ſixteen feet high. In conſequence of their being ſlenderer, they are much more active than the common whale; they remain a longer time at the bottom, and afford a ſmaller quantity of oil. As in the common whale the head makes a third part of its bulk, ſo in this ſpecies the head makes one half of the whole. The cachalot is as deſtructive among leſſer fiſhes as the whale is harmleſs; and can at one gulp ſwallow a ſhoal of fiſhes down its enormous gullet. Linnæus tells us that this fiſh purſues and terrifies the dolphins and porpeſſes and often drives them on ſhore.

But, how formidable ſoever this fiſh may be to its fellows of the deep, it is by far the moſt valuable, as it contains two very precious drugs, ſpermaceti and ambergriſe. Indeed the whole oil of the fiſh is very eaſily convertible into ſpermaceti. This is performed by boiling it with a lea of pot-aſh, and hardening it in the manner of ſoap. Candles are now made of it, which are ſubſtituted for wax, and ſold much cheaper.

Reſpecting the ambergriſe which is ſometimes found in this whale, it was long conſidered as a ſubſtance found floating on the ſurface of the ſea; but time, that reveals the ſecrets of the mercenary, has diſcovered that it chiefly belongs to this animal. The name, which has been improperly given to the former ſubſtance, ſeems more juſtly to belong to this; for the ambergriſe is found in the place where the ſeminal veſſels are uſually ſituated in other animals. It is found in a bag of three or four feet long, in round lumps, from one to twenty pounds weight, floating in a fluid ſomewhat thinner than oil, and of a yellowiſh colour. There are never ſeen more than four at a time in one of theſe bags; and that which weighed twenty pounds, and which was the largeſt ever ſeen, was found ſingle. Theſe balls of ambergriſe are not found in all fiſhes of this kind, but are chiefly to be met with in the oldeſt and ſtrongeſt. The uſes of this medicine for the purpoſes of luxury and as a perfume are well known; though upon ſome ſubjects ignorance is preferable to information.

The Dolphin, the Grampus, and the Porpeſſe.

All theſe fiſh have teeth both in the upper and lower jaw, and are much leſs than the whale. The grampus, which is the largeſt, never exceeds twenty feet. It may alſo be diſtinguiſhed by the flatneſs of its head, which reſembles a boat turned upſide down. The porpeſſe reſembles the grampus in moſt things, but it is ſeldom above eight feet long: its ſnout too is rather like that of an hog. The dolphin has a ſtrong reſemblance to the porpeſſe, except that its ſnout is longer and more pointed. They have all fins on the back: they all have heads very large, like the reſt of the whale kind; and reſemble each other in their appetites, their manners, and conformations; being equally voracious, active, and roving.

The great agility of theſe animals makes it very difficult to take them. They ſeldom remain a moment above water; ſometimes, indeed, their too eager purſuits expoſe them to danger; and a ſhoal of herrings often allures them out of their depth. In ſuch a caſe, the hungry animal continues to flounder in the ſhallows till knocked on the head, or till the retiring tide affords it relief. But all this tribe, and the dolphin in particular, are not leſs ſwift than deſtructive. No fiſh could eſcape them, but from the awkward poſition of the mouth, which is placed in a manner under the head. Yet, even with theſe diſadvantages, their depredations are ſo great, that they have been juſtly ſtiled the plunderers of the deep.

We are told, that theſe animals go with young ten months; that, like the whale, they ſeldom bring forth above one at a time, and that in the midſt of ſummer. They are ſaid to live to a conſiderable age though ſome reſtrict it to about thirty years: and they ſleep with the ſnout above water.

CHAP.

CHAP. XXX.

OF CARTILAGINOUS FISHES IN GENERAL—OF THE SHARK SPECIES—OF THE RAY do.—THE SKATE—THE THORNBACK—MANNER OF FISHING FOR THEM—THE ROUGH RAY—THE FIRE-FLARE—THE TORPEDO—THE LAMPREY—THE STURGEON—THE ISINGLASS-FISH—THE SUN-FISH—THE FISHING-FROG—THE LUMP-FISH—THE SEA-SNAIL—THE PIPE-FISH—THE HIPPOCAMPUS—THE SEA-ORB—THE SEA-HEDGE-HOG—THE GALLEY-FISH.

WE have ſeen the fiſhes of the cetaceous kind bear a ſtrong reſemblance to quadrupeds in their conformation; thoſe of the cartilaginous kinds are one remove ſeparated from them: they form the ſhade that completes the imperceptible gradations of Nature.

The firſt great diſtinction which the cartilaginous tribe of fiſhes exhibit is, their having cartilages or griſtles inſtead of bones. The ſize of all fiſhes increaſes with age; but from the pliancy of the bones in this tribe, they ſeem to have no bounds ſet to their dimenſions: and it is ſuppoſed that they grow larger every day till they die.

In the conformation of Cartilaginous fiſhes the principal properties of both the other claſſes are united. Like the cetaceous tribes, they have organs of hearing, and lungs: like the ſpinous kinds, they have gills, and an heart without a diviſion.

From this ſtructure of their gills, they are enabled to live a longer time out of water than other fiſhes. The cartilaginous ſhark, or ray, live ſome hours after they are taken; while the ſpinous herring or mackarel expire a few minutes after they are brought on ſhore. Some of this claſs bring forth their young alive; and ſome produce eggs, which are afterwards brought to maturity. In all, however, the manner of geſtation is nearly the ſame; for upon diſſection, it is always found, that the young, continue in the egg till a very little time before they leave the womb. Theſe eggs therefore, they may properly be ſaid to hatch within their body; and as ſoon as their young quit the ſhell, they begin to quit the womb alſo.

Of the Shark Kind.

Of all the inhabitants of the deep, thoſe of the ſhark kind are the fierceſt and the moſt voracious. The ſmalleſt of this tribe is not leſs dreaded by greater fiſh, than many that to appearance ſeem more powerful; nor do any of them ſeem fearful of attacking animals far above their ſize: but the Great White Shark, which is the largeſt of the kind, joins to the moſt amazing rapidity, the ſtrongeſt appetites for miſchief: as he approaches nearly in ſize to the whale, he far ſurpaſſes him in ſtrength and celerity, in the formidable arrangement of his teeth, and his inſatiable deſire of plunder.

The white Shark.

The white Shark is ſometimes ſeen to rank even among whales for magnitude; and is found from twenty to thirty feet long. Some aſſert that they have ſeen them of four thouſand pound weight; and we are told particularly of one, that had a human corpſe in its belly. The head large, and ſomewhat flatted; the ſnout long, and the eyes large. The mouth is enormouſly wide; as is the throat, and capable of ſwallowing a man with great eaſe. But its furniture of teeth is ſtill more terrible. Of theſe there are ſix rows, extremely hard, ſharp-pointed, and of a wedge-like figure. It is aſſerted that there are ſeventy-two in each jaw, which make one hundred and forty-four in the whole; yet others think that their number is uncertain; and that, in proportion as the animal grows older, theſe terrible inſtruments of deſtruction are found to increaſe. With theſe the jaws both above and below are repeated; but the animal has a power of erecting or depreſſing them at pleaſure. When the ſhark is at reſt, they lie quite flat in his mouth; but when he prepares to ſeize his prey, he erects all this dreadful apparatus, by the help of a ſet of muſcles that join them to the jaw. And the animal he ſeizes, dies, pierced with a hundred wounds in a moment.

Nor is the fiſh leſs terrible with reſpect to the reſt of his form: his fins are larger, in proportion; and he is furniſhed with great goggle eyes, that he turns with eaſe on every ſide, ſo as to ſee his prey behind him as well as before. His whole aſpect too is marked with a character of malignity: his ſkin alſo is rough, hard and prickly; being that ſubſtance which covers inſtrument caſes, called ſhagreen.

As the ſhark is thus formidable in his appearance, ſo is he alſo dreadful, from his courage and activity. No fiſh can ſwim ſo faſt as the ſhark, he outſtrips the ſwifteſt ſhips. Such amazing powers, with ſuch great appetites for deſtruction, could quickly unpeople even the ocean, but providentially the ſhark's upper jaw projects ſo far above the lower, that he is obliged to turn on one ſide (not on his back, as is generally ſuppoſed) to ſeize his prey. As this operation requires ſome time, the animal purſued ſeizes that opportunity to make its eſcape.

Still, however, the depredations he commits are frequent and formidable. The ſhark is the dread of ſailors in all hot climates; where, like a greedy robber, he attends the ſhips, in expectation of what may drop over board. A man who unfortunately falls into the ſea at ſuch a time, is ſure to periſh. A ſailor that was bathing in the Mediterranean, near Antibes, in the year 1744, while he was ſwimming about fifty yards from the ſhip, perceived a monſtrous fiſh making towards him and ſurveying him on every ſide, as fiſh are often ſeen to look round a bait. The poor man, ſtruck with terror at its approach cried out to his companions in the veſſel to take him on board. They accordingly threw him a rope with the utmoſt expedition, and were drawing him up by the ſhip's ſide, when the ſhark darted after him from the deep, and ſnapped off his leg.

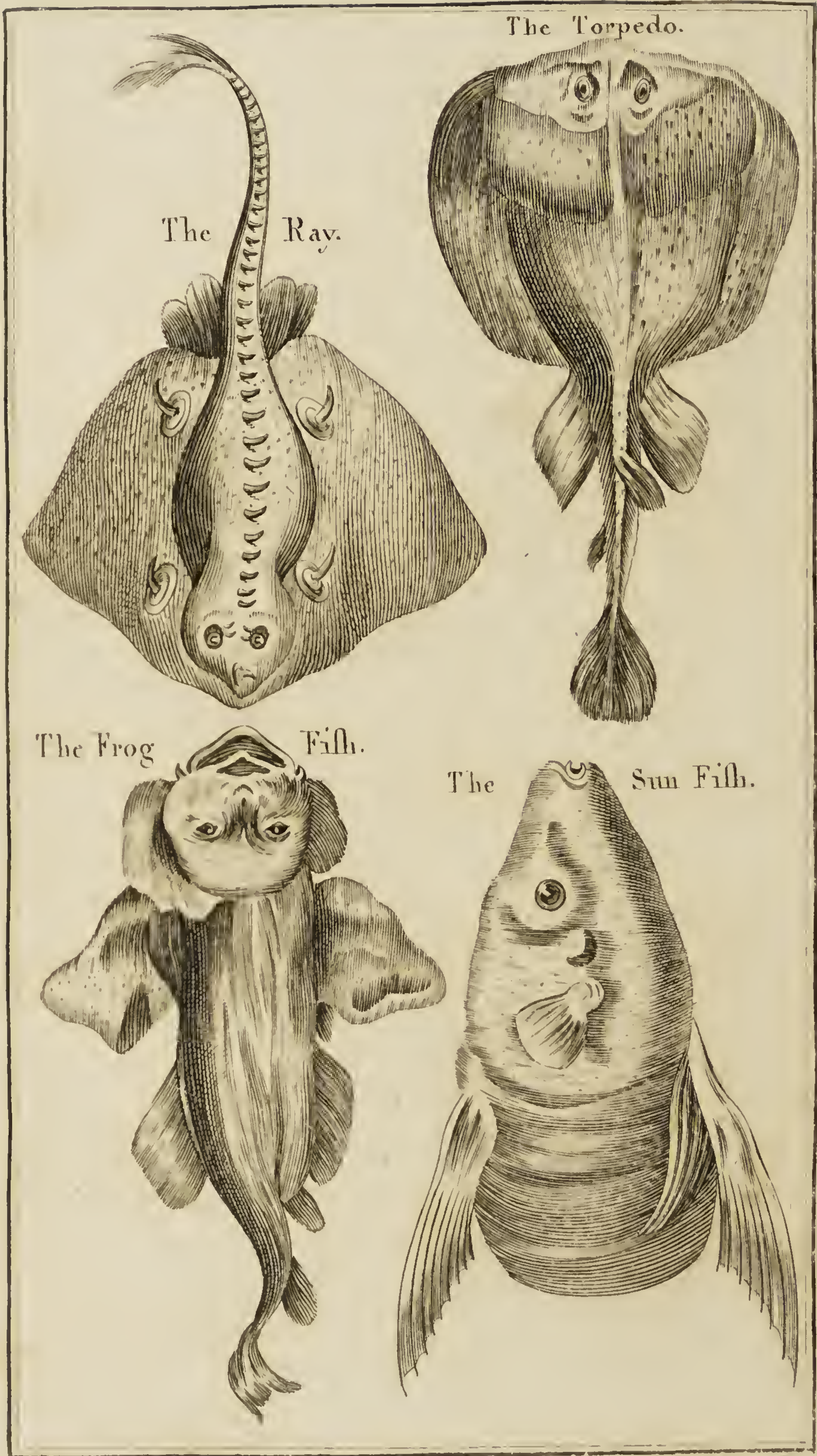
Mr Pennant tells us, that the maſter of a Guinea-ſhip, finding a rage for ſuicide prevail among his ſlaves, from a notion the unhappy creatures had, that after death they ſhould be reſtored again to their families, friends and country. To convince them at leaſt that ſome diſgrace ſhould attend them here, he ordered one of their dead bodies to be tied by the heels to a rope, and ſo let down into the ſea; and though it was drawn up again with great ſwiftneſs, yet, in that ſhort ſpace, the ſhark had bitten off all but the feet. A Guinea captain was, by ſtreſs of weather, driven into the harbour of Belfaſt, with a lading of very ſickly ſlaves, who, in the manner above-mentioned, took every opportunity to throw themſelves over board when brought upon deck, as is uſual, for the benefit of the freſh air. The captain perceiving, among others, a woman ſlave attempting to drown herſelf, pitched upon her as a proper example to the reſt. As he ſuppoſed that they did not know the terrors attending death, he ordered the woman to be tied with a rope under the arm-pits, and ſo let her down into the water. When the poor creature was plunged in, and about half way down, ſhe was heard to give a terrible ſhriek, which at firſt was aſcribed to her fears of drowning; but ſoon after the water appearing red all round her, ſhe was drawn up, and it was found that a ſhark, which had followed the ſhip had bit her off from the middle.

The common method by which our ſailors take the ſhark, is to bait a great hook with a piece of beef or pork, which is thrown out into the ſea by a ſtrong cord, ſtrengthened near the hook with an iron chain, Without this precaution, the ſhark would quickly bite the cord in two, and make off. It is no unpleaſant amuſement to obſerve this voracious animal coming up to ſurvey the bait, particularly when not preſſed by hunger. He approaches it, examines it, ſwims round it, ſeems for a while to neglect it, perhaps apprehenſive of the cord and the chain. He quits it for a little; but his appetite preſſing, he returns again; appears preparing to devour it, but quits it once more. When the ſailors have ſufficiently diverted themſelves with his different evolutions, they then make a pretence, by drawing the rope, as if about to take the bait away. It is then that the glutton's hunger excites him; he darts at the bait, and ſwallows it, hook and all. Sometimes, however, he does not ſo entirely gorge the whole, but that he once more gets off; yet even then, though wounded and bleeding with the hook, he will again purſue the bait until he is taken. When he finds the hook lodged in his maw, his utmoſt efforts are then excited, but in vain to get free: he tries with his teeth to cut the chain: he pulls with all his force to break the line: he almoſt ſeems to turn his ſtomach inſide out, to diſgorge the hook: in this manner he continues his formidable though fruitleſs efforts. At laſt, however, being quite ſpent, he ſuffers his head to be drawn above water, and the ſailors confining his tail by a nooſe, in this manner draw him on ſhip board, and diſpatch him. This is done by beating him on the head till he dies; yet even this is not effected without difficulty and danger. The enormous creature, terrible even in the agonies of death, ſtill ſtruggles with his deſtroyers; nor is there an animal in the world that it is more difficult to kill. Even when cut in pieces, the muſcles ſtill preſerve their motion, and vibrate for ſome minutes after being ſeparated from the body. Another method of taking him, is by ſtriking a barbed inſtrument, called a fizgig, into his body, as he bruſhes along by the ſide of the ſhip. As ſoon as he is taken up, to prevent his flouncing, they cut off the tail with an ax, with the utmoſt expedition.

This is the manner in which Europeans deſtroy the ſhark; but ſome of the negroes along the African coaſt, take a bolder and more dangerous method to combat their terrible enemy. Armed with nothing but a knife, the negroe plunges into the water, where he ſees the ſhark watching for his prey, and boldly ſwims forward to meet him. Notwithſtanding this, the voracious animal ſuffers the man to approach him, but juſt as he turns upon his ſide to ſeize the agreſſor, the negroe watches the opportunity, plunges his knife in the fiſh's belly, and purſues his blows with ſucceſs, that he entirely vanquiſhes the ravenous

tyrant.

Plate 32.


The Torpedo.
The Ray.
The Frog Fiſh.
The Sun Fiſh.

J. Fraser sc.

tyrant. Upon this, he fixes the fiſh's head in a nooſe, and drags him to ſhore, where he makes a noble feaſt for the adjacent villages.

Nor is man alone the only enemy this fiſh has to fear: the remora, or ſucking fiſh, is probably a ſtill greater, and follows the ſhark every where. This fiſh has got a power of adhering to whatever it ſticks againſt, in the ſame manner as a cupping-glaſs ſticks to the human body. It is by ſuch an apparatus that this animal ſticks to the ſhark, drains away its moiſture.

Upon the whole, a ſhark, when living, is a very formidable animal; and, when dead, is of very little value. The fleſh is hardly digeſtible by any but the Negroes, who are fond of it to diſtraction; the liver affords three or four quarts of oil; ſome imaginary virtues have been aſcribed to the brain; and its ſkin is, by great labour, poliſhed into that ſubſtance called ſhagreen. Mr Pennant is of opinion, that the female is larger than the male in all this tribe; which would, if confirmed by experience, make a ſtriking agreement between them and birds of prey. It were to be wiſhed that ſucceeding hiſtorians would examine into this obſervation, which is offered only as a conjecture!

Cartilaginous Fiſhes of the Ray Species.

All the fiſhes of this kind reſemble each other very ſtrongly in their figure; nor is it eaſy to diſtinguiſh one from another. The ſtranger to this dangerous tribe may imagine he is only handling a ſkate when he is inſtantly ſtruck numb by the torpedo; and he may ſuppoſe he has caught a thornback till he is ſtung by the fire-flare.

By the ſpines only theſe animals are diſtinguiſhed from each other. The ſkate has the middle of the back rough, and a ſingle row of ſpines on the tail. The ſharp noſed ray has ten ſpines that are ſituated towards the middle of the back. The rough ray has its ſpines ſpread indiſcriminately over the whole back. The thorn-back has its ſpines diſpoſed in three rows on the back. The fire-flare has but one ſpine, but that indeed a terrible one. This dangerous weapon is placed on the tail, about four inches from the body, and is not leſs than five inches long. It is of a flinty hardneſs, the ſides thin, ſharp pointed, and cloſely and ſharply bearded the whole way. The laſt of this tribe that I ſhall mention is the torpedo; and this animal has no ſpines that can wound; but in the place of them it is poſſeſſed of one of the moſt extraordinary faculties in nature.

Such are the principal differences that may enable us to diſtinguiſh animals, ſome of which are of very great uſe to mankind, from others that are terrible and noxious. With reſpect to their uſes indeed, as we ſhall ſoon ſee, they differ much; but the ſimilitude among them, as to their nature, appetites, and conformation, is perfect and entire. They are all as voracious as they are plenty; and as dangerous to a ſtranger as uſeful to him who can diſtinguiſh their differences.

Of all the larger fiſh of the ſea, theſe are the moſt numerous; and they owe their numbers to their ſize. Except the white ſhark and cachalot alone, there is no other fiſh that has a ſwallow large enough to take them in; and their ſpines make them a ſtill more dangerous morſel. Yet the ſize of ſome is ſuch, that even the ſhark himſelf is unable to devour them. We have ſeen ſome of them in England weigh above two hundred pounds; but that is nothing to their enormous bulk in other parts of the world. Labat tells us of a prodigious ray that was ſpeared by the negroes at Guadaloupe, which was thirteen feet eight inches broad, and above ten feet from the ſnout to the inſertion of the tail. The tail itſelf was in proportion, for it was no leſs than fifteen feet long; twenty inches broad at its inſertion, and tapering to a point. The body was two feet deep. The ſkin was as thick as leather, and marked with ſpots, which ſpots in all of this kind, are only glands, that ſupply a mucus to lubricate and ſoften the ſkin. This enormous fiſh was quite uſeleſs to the Europeans; but the negroes choſe out ſome of the niceſt bits, and carefully ſalted them up as a moſt favourite proviſion.

It is chiefly during the winter ſeaſon that our fiſhermen fiſh for the ray; but the Dutch, who are indefatigable, begin their operations earlier, and fiſh with better ſucceſs than we do. The method practiſed by the fiſhermen of Scarborough is thought to be the beſt among the Engliſh; and, as Mr Pennant has given a very ſuccinct account of it, I will take leave to preſent it to the reader.

" When they go out to fiſh, each perſon is provided with three lines. Each man's lines are fairly coiled upon a flat oblong piece of wicker work; the hooks being baited and placed very regularly in the centre of the coil. Every line is furniſhed with two hundred and eighty hooks, at the diſtance of ſix feet two inches from each other. The hooks are faſtened to lines of twiſted horſe-hair, twenty-ſeven inches long. The line is laid acroſs the current, and always remains upon the ground about ſix hours.

" The beſt bait for all kinds of fiſh, is freſh herring cut in pieces of a proper ſize. Next to herrings are the leſſer lampreys, which come all winter by land-carriage from Tadcaſter. The next baits in eſteem are ſmall haddocks cut in pieces, ſand-worms, muſcles, and limpets: and laſtly, when none of theſe can be found, they uſe bullock's liver. The hooks uſed there are much ſmaller than thoſe employed at Iceland and Newfoundland; and are only two inches and an half long in the ſhank. The line is made of ſmall tanned cording, and is about thirteen miles long."

But this extent of line, is nothing to what the Italians throw out in the Mediterranean. Their fiſhing is carried on in a tartan, which is a veſſel much larger than ours; and they bait a line of no leſs than twenty miles long, with above ten or twelve thouſand hooks. This line is not regularly drawn every ſix hours, as with us, but remains ſome time in the ſea; and it requires the ſpace of twenty-four hours to take it up. By this apparatus they take rays, ſharks, and other fiſh; ſome of which are above a thouſand pounds weight. When they have caught any of this ſize, they ſtrike them through with an harpoon to bring them on board, and kill them as faſt as they can.

This method of catching fiſh is both fatiguing and dangerous; but the value of the prize generally repays the pain. The ſkate and the thornback are very good food; and their ſize, which is from ten pounds to two hundred weight, very well rewards the trouble of fiſhing them. But it ſometimes happens that the lines are viſited by very unwelcome intruders; by the rough ray, the fire-flare, or the torpedo.

The rough ray inflicts but ſlight wounds with the prickles with which its whole body is furniſhed. To the ignorant it ſeems harmleſs, and a man would at firſt ſight venture to take it in his hand, without any apprehenſion. He ſoon, however, finds, that there is not a ſingle part of its body that is not armed with ſpines; and that there is no way of ſeizing the animal, but by the little fin at the end of the tail.

But this animal is harmleſs, when compared to the fire-flare, which ſeems to be the dread of even the boldeſt and moſt experienced fiſhermen. The ſpine, with which this animal wounds its adverſaries, is not venomous, as has been vulgarly ſuppoſed. In fact, it is a weapon of offence belonging to this animal, and capable, from its barbs, of inflicting a very terrible wound, attended with dangerous ſymptoms. It is fixed to the tail, as a quill is into the tail of a fowl, and is annually ſhed in the ſame manner.

The Torpedo.

The torpedo is an animal of this kind, equally formidable and well known with the former; but the manner of its operating, ſtill remains a myſtery to mankind. The body of this fiſh is almoſt circular, and thicker than others of the ray kind. The ſkin is ſoft, ſmooth, and of a yellowiſh colour, marked, as all the kind, with large annular ſpots. The eyes are very ſmall: the tail tapers to a point; and the fiſh weighs from a quarter to fifteen pounds. Redi found one twenty-four pounds weight. To all outward appearance, it is furniſhed with no extraordinary powers. It has no muſcles formed for very great exertions; no internal conformation perceptibly differing from the reſt of its kind; yet ſuch is that unaccountable power it poſſeſſes, that the inſtant it is touched, it numbs not only the hand and arm, but ſometimes even the whole body. The ſhock received, by all accounts, moſt reſembles the ſtroke of an electrical machine; ſudden, tingling, and painful. "The inſtant," ſays Kempfer, "I touched it with my hand, I felt a terrible numbneſs in my arm, and as far up as the ſhoulder. Even if one treads upon it with his ſhoe, it affects not only the leg, but the whole thigh upwards. Thoſe who touch it with the foot, are ſeized with a ſtronger palpitation than even thoſe who touched it with the hand. This numbneſs bears no reſemblance to that which we feel when a nerve is a long time preſſed, and the foot is ſaid to be aſleep. It rather appears like a ſudden vapour, which paſſing through the pores in an inſtant, penetrates to the very ſprings of life, from whence it diffuſes itſelf over the whole body, and gives real pain. The nerves are ſo affected, that the perſon ſtruck imagines all the bones of his body, and particularly thoſe of the limb that received the blow, to be driven out of joint. All this is accompanied with an univerſal tremor, a ſickneſs of the ſtomach, a general convulſion, and a total ſuſpenſion of the faculties of the mind. In ſhort," continues Kempfer, "ſuch is the pain, that all the force of our promiſes and authority could not prevail upon a ſea-man to undergo the ſhock a ſecond time. A negroe indeed, that was ſtanding by, readily undertook to touch the torpedo, and was ſeen to handle it without feeling any of its effects. He informed us, that his whole ſecret conſiſted in keeping in his breath; and we found, upon trial, that this method anſwered with ourſelves. When we held in our breath, the torpedo was harmleſs; but when we breathed ever ſo little, its efficacy took place."

Although we are ſtrangers to the nature of the torpedo, yet we have ſome facts which relate to the manner of its acting. Reumur, who made ſeveral experiments upon this animal, has at leaſt convinced the world that it is not neceſſarily, but by an effort, that the torpedo numbs the hand of him that touches it. He tried ſeveral times, and could eaſily tell when the fiſh intended the ſtroke, and when it was about to continue harmleſs. Always before the fiſh intended the ſtroke, it flattened the back, raiſed the head and the tail; and then, by a violent contraction in the oppoſite direction, ſtruck with its back againſt the preſſing finger; and the body, which before was flat, became humped and round.

The moſt probable ſolution of this phenomenon is, that it depends upon electricity. When the fiſh is dead, the whole power is deſtroyed, and it may be handled or eaten with perfect ſecurity. It is now known that there are more fiſh than this of the ray kind, poſſeſſed of the numbing quality, which has acquired them the name of the torpedo. Theſe are deſcribed by Atkins and Moore, and abound in the coaſt of Africa. They are ſhaped like a mackarel, except that the head is much larger; and the effects of theſe ſeem to differ in ſome reſpects. M. Condamine alſo ſpeaks of a fiſh reſembling a lamprey, endued with ſimilar powers. This animal, if touched with the hand, or even a ſtick, inſtantly benumbs the hand and arm to the very ſhoulder.

The Lamprey.

There is a ſpecies of the lamprey ſerved up as a great delicacy among the modern Romans very different from ours. Whether their lamprey be the murena of the ancients I will not pretend to ſay; but there is nothing more certain than that our lamprey is not.

The lamprey known among us is differently eſtimated, according to the ſeaſon in which it is caught, or the place where it has been fed. Thoſe that leave the ſea to depoſit their ſpawn in freſh waters are the beſt. Thoſe on the contrary, that are entirely bred in our rivers, and that have never been at ſea, are conſidered as much inferior to the former. Thoſe that are taken in the months of March, April, or May, juſt upon their leaving the ſea, are reckoned very good. Thoſe again that are caught after they have caſt their ſpawn, are ſound to be flabby and of little value.

The lamprey in its general appearance, is very like an eel, but it is of a lighter colour, and rather of a clumſier make. It differs however, in the mouth, which is round, and placed rather obliquely below the end of the noſe. It reſembles the mouth of a leech more than that of an eel; and the animal has a hole on the top of the head, through which it ſpouts water, as in the cetaceous kind. There are ſeven holes on each ſide for reſpiration; and the fins are formed rather by a lengthening out of the ſkin, than by any ſet of bones or ſpines for that purpoſe. As its mouth is pretty like that of a leech, ſo like that animal it ſticks cloſe to, and ſucks any body. It is extraordinary the power they have of adhering to ſtones; which they do ſo firmly as not to be drawn off without conſiderable difficulty. We are told of one that weighed but three pounds; and yet it ſtuck ſo firmly to a ſtone of twelve pounds, that the ſtone remained ſuſpended at its mouth. With reſpect to the inteſtines of the lamprey, it ſeems to have but one great bowel, running from the mouth to the vent, narrow at both ends, and wide in the middle.

So ſimple a conformation ſeems to imply an equal ſimplicity of appetite. In fact, the lamprey's food is either ſlime and water, or ſuch ſmall water-inſects as are ſcarce perceivable. Perhaps its appetite may be more active at ſea, of which it is properly a native; but when it comes up into our rivers, it is hardly perceived to devour any thing.

Its uſual time of leaving the ſea, which it is annually ſeen to do in order to ſpawn, is about the beginning of ſpring; and after a ſtay of a few months it returns. Their preparation for ſpawning is peculiar; their manner is to make holes in the gravelly bottom of rivers; and on this occaſion their ſucking power is particularly ſerviceable; for if they meet with a ſtone of a conſiderable ſize, they will remove it. Their young are produced from eggs in the manner of flat fiſh: and the female continues with them till they come forth. She is ſometimes ſeen with her whole family playing about her; and after ſome time ſhe conducts them in triumph back to the ocean.

How much they were valued among the ancients, or a fiſh bearing ſome reſemblance to them, appears from all the claſſics that have praiſed good living or ridiculed gluttony. One ſtory we are told of this fiſh with which I will conclude its hiſtory. A ſenator of Rome, whoſe name does not deſerve being tranſmitted to poſterity, was famous for the delicacy of his lampreys. Tigelinus, Manucius, and all the celebrated epicures of Rome, were loud in his praiſes: no man's fiſh had ſuch a flavour, was ſo nicely fed, or ſo exactly pickled. Auguſtus, hearing ſo much of that man's entertainments, deſired to be his gueſt; and ſoon found that fame had been juſt to his merits; the man had indeed very fine lampreys, and of an exquiſite flavour. The emperor was deſirous of knowing the method by which he fed his fiſh to ſo fine a reliſh; and the glutton, making no ſecret of his art, informed him that his way was to throw into his ponds ſuch of his ſlaves as had at any time diſpleaſed him. Auguſtus, we are told, was not much pleaſed with his receipt; and inſtantly ordered all his ponds to be filled up. The ſtory would have ended better if he had ordered the owner to be flung in alſo.

The Sturgeon.

The Sturgeon in its general form reſembles a freſh-water pike. The noſe is long; the mouth is ſituated below, being ſmall, and without jaw-bones or teeth. But, though it is ſo harmleſs and ill provided for war, the body is formidable enough to appearance. It is long, pentagonal, and covered with five rows of large bony knobs, one row on the back, and two on each ſide, and a number of fins to give it greater expedition. Of this fiſh there are three kinds; the common ſturgeon, the caviar ſturgeon, and the huſo or iſinglaſs fiſh. The largeſt ſturgeon we have heard of caught in Great-Britain was a fiſh taken in the Eſke, which weighed four hundred and ſixty pounds. An enormous ſize to thoſe who have only ſeen our freſh water fiſhes!

As the ſturgeon is an harmleſs fiſh it is never caught by a bait in the ordinary manner of fiſhing, but always in nets. From the quality of floundering at the bottom it has received its name; which comes from the German verb *ſtoeren*, ſignifying to wallow in the mud. That it lives upon no large animals is obvious to all thoſe who cut it open, where nothing is found in its ſtomach but a kind of ſlimy ſubſtance, which has induced ſome to think that it lives only upon water and air.

The ſturgeon uſually comes up rivers to depoſit its ſpawn, about the beginning of ſummer, when the fiſhermen of all great rivers hold themſelves in readineſs for its reception. At Pillau particularly the ſhores are formed into diſtricts, and allotted to companies of fiſhermen, ſome of which are rented for about three hundred pounds a year. The nets in which the ſturgeon is caught, are made of ſmall cord, and placed acroſs the mouth of the river; but in ſuch a manner that, whether the tide ebbs or flows, the pouch of the net goes with the ſtream. The ſturgeon thus caught, while in the water, is one of the ſtrongeſt fiſhes that ſwims, and often breaks the net to pieces that incloſes it; but the inſtant it is raiſed with its head above water, all its activity is loſt. It is then a ſpiritleſs lump, and ſuffers itſelf to be tamely dragged on ſhore.

The fleſh of this animal pickled is very well known at all the tables of Europe; and is even more prized in England than in any of the countries where it is uſually caught. The fiſhermen have two different methods of preparing it. The one is by cutting it in long pieces lengthwiſe, and having ſalted them, by hanging them up in the ſun to dry. The fiſh thus prepared is ſold in all the countries of the Levant, and ſupplies the want of better proviſion. The other method, which is uſually practiſed in Holland, and along the ſhores of the Baltic, is to cut the ſturgeon croſswiſe into ſhort pieces, and put it into ſmall barrels, with a pickle made of ſalt and ſaumure. This is the ſturgeon which is ſold in England, and of which great quantities come from the North.

A very great trade is alſo carried on with the roe of the ſturgeon, preſerved in a particular manner, and called Caviar. It is made from the roe of all kinds of ſturgeon, but particularly the ſecond. This is much more in requeſt in other countries of Europe than with us. To all theſe high reliſhed meats, the appetite muſt be formed by degrees; and though formerly even in England it was very much prized at the politeſt tables, it is at preſent entirely neglected. It is ſtill, however, a conſiderable merchandize among the Turks, Greeks, and Venetians. Caviar ſomewhat reſembles ſoft ſoap in conſiſtence; but it is of a brown colour, and is eaten as cheeſe with bread.

The Huſo, or Iſinglaſs Fiſh.

The huſo, or iſinglaſs fiſh furniſhes a ſtill more valuable commodity. This fiſh is caught in great quantities in the Danube, from the months of October to January. It is ſeldom below fifty pounds weight, and often above four hundred. Its fleſh is ſoft, glutinous, and flabby; but it is ſometimes ſalted, which makes it better taſted, and then it becomes red like ſalmon. It is for the commodity it furniſhes that it is chiefly taken. The manner of making it is this. They take the ſkin, the entrails, the fins, and the tail of this fiſh, and cut them into ſmall pieces. Theſe are left to macerate in a ſufficient quantity of warm water, and they are all boiled ſhortly after with a ſlow fire, until they are diſolved and reduced to a jelly. This jelly is ſpread upon inſtruments made for the purpoſe, ſo, that whilſt it dries, it aſſumes the form of parchment, and, when quite dry, it is then rolled into the form in which we ſee it in the ſhops. This valuable commodity is principally furniſhed from Ruſſia, where they prepare great quantities ſurpriſingly cheap.

Above all others, the cartilaginous claſs exhibits a variety of ſhapeleſs beings, the deviations of which from the uſual form of fiſhes are beyond the power of words to deſcribe, and almoſt of the pencil to draw. In this claſs we have the *Pipe fiſh*, that almoſt tapers to a thread, and the *Sun fiſh*, that has the appearance of a bulky head, but the body cut off in the middle; the *Hippocampus*, with an head ſomewhat like that of an horſe, and the *Water Bat*, whoſe head can ſcarcely be diſtinguiſhed from the body. In this claſs we find the Fiſhing Frog, which from its deformity ſome have called the *Sea Devil*, the *Chimæra*, the *Lump Fiſh*, the *Sea Porcupine*, and the *Sea Snail*. Of all theſe the hiſtory is but little known; and naturaliſts ſupply the place with deſcription.

The Sun Fiſh.

The ſun fiſh ſometimes grows to a very large ſize. One taken near Plymouth was five hundred weight. In form it reſembles a bream, or ſome deep fiſh cut off in the middle: the mouth is very ſmall, and contains in each jaw two broad teeth, with ſharp edges. The colour of the back is duſky and dappled, and the belly is of a ſilvery white. When boiled, it has been obſerved to turn to a glutinous jelly, and would moſt probably ſerve for all the purpoſes of iſinglaſs, were enough of it found.

The Fiſhing Frog.

The fiſhing frog in ſhape very much reſembles a tad-pole or young frog, but it is of an enormous ſize, for it grows to above five feet long, and its mouth is ſometimes a yard wide. The eyes are placed on the top of the head, and are encircled with prickles. Immediately above the noſe there are two long beards or filaments, ſmall in the beginning, but thicker at the end, and round: theſe are ſaid, to anſwer a very ſingular purpoſe; for being made ſomewhat like a fiſhing-line, it is aſſerted, that the animal converts them to the purpoſes of fiſhing. With theſe extended, the fiſhing frog is ſaid to hide itſelf in muddy waters, and to leave nothing but the beards to be ſeen. The curioſity of the ſmaller fiſh bring them to view theſe filaments, and their hunger induces them to ſeize the bait. Upon this the animal in ambuſh inſtantly draws in its filaments with the little fiſh that had taken the bait, and devours it in an inſtant. This ſtory, though apparently improbable, has gained upon ſome of our beſt naturaliſts. The fiſhermen, have, in general, a great regard for this ugly fiſh, as it is an enemy to the dog fiſh, the bodies of thoſe fierce and voracious animals being often found in its ſtomach. Whenever they take it, therefore they always ſet it at liberty.

The Lump Fiſh.

The lump fiſh is trifling in ſize, compared to the former. Its length is but ſixteen inches, and its weight about four pounds: the ſhape of the body is like that of a bream, deep, and it ſwims edgeways; the back is ſharp and elevated, and the belly is flat. The lips, mouth, and tongue of this animal are of a deep red: the whole ſkin is rough, with bony knobs, and the largeſt row is along the ridge of the back. The belly is of a bright crimſon colour; but a circumſtance peculiar to this fiſh, is an oval aperture in the belly, ſurrounded with a fleſhy, ſoft ſubſtance, that ſeems bearded all round. By this it adheres with vaſt force to any thing it pleaſes. If flung into a pail of water, it will ſtick ſo cloſs to the bottom, that on taking the fiſh by the tail, one may lift up pail and all, though it hold ſeveral gallons of water. Great numbers of theſe fiſh are found along the coaſts of Greenland in the beginning of ſummer, where they reſort to ſpawn. Their roe is remarkably large, and the Greenlanders boil it to a pulp for eating. They are extremely fat, but not admired in England, being both flabby and inſipid.

The Sea Snail.

The ſea ſnail takes its name from the ſoft and unctuous texture of its body, which reſembles that of the ſnail upon land. It is almoſt tranſparent, and ſoon diſſolves. It is not above five inches long. The colour, when freſh taken, is of a pale brown, and the ſhape of the body is round. It is taken in England at the mouths of rivers, four or five miles diſtant from the ſea.

The Pipe Fiſh.

The body of the pipe fiſh, in the thickeſt part, is not thicker than a ſwan-quill, while it is above ſixteen inches long. Its general colour is an olive brown, marked with numbers of bluiſh lines, pointing from the back to the belly. It is viviparous; for, on cruſhing one that was juſt taken, hundreds of very minute young ones were obſerved to crawl about.

The Hippocampus.

The Hippocampus, which from the form of its head ſome call the Sea Horſe, is not above nine inches long. It is about as thick as a man's thumb, and the body is ſaid, while alive, to have hair on the fore part, which falls off when it is dead. The ſnout is a ſort of a tube with a hole at the bottom, to which there is a cover, which the animal can open and ſhut at pleaſure. Behind the eyes there are two fins, which look like ears; and above them are two holes, which ſerve for reſpiration. In ſhort it is rather like a great caterpillar than a fiſh.

From theſe harmleſs animals, covered with a ſlight coat of mail, we may proceed to others, more thickly defended, and more formidably armed.

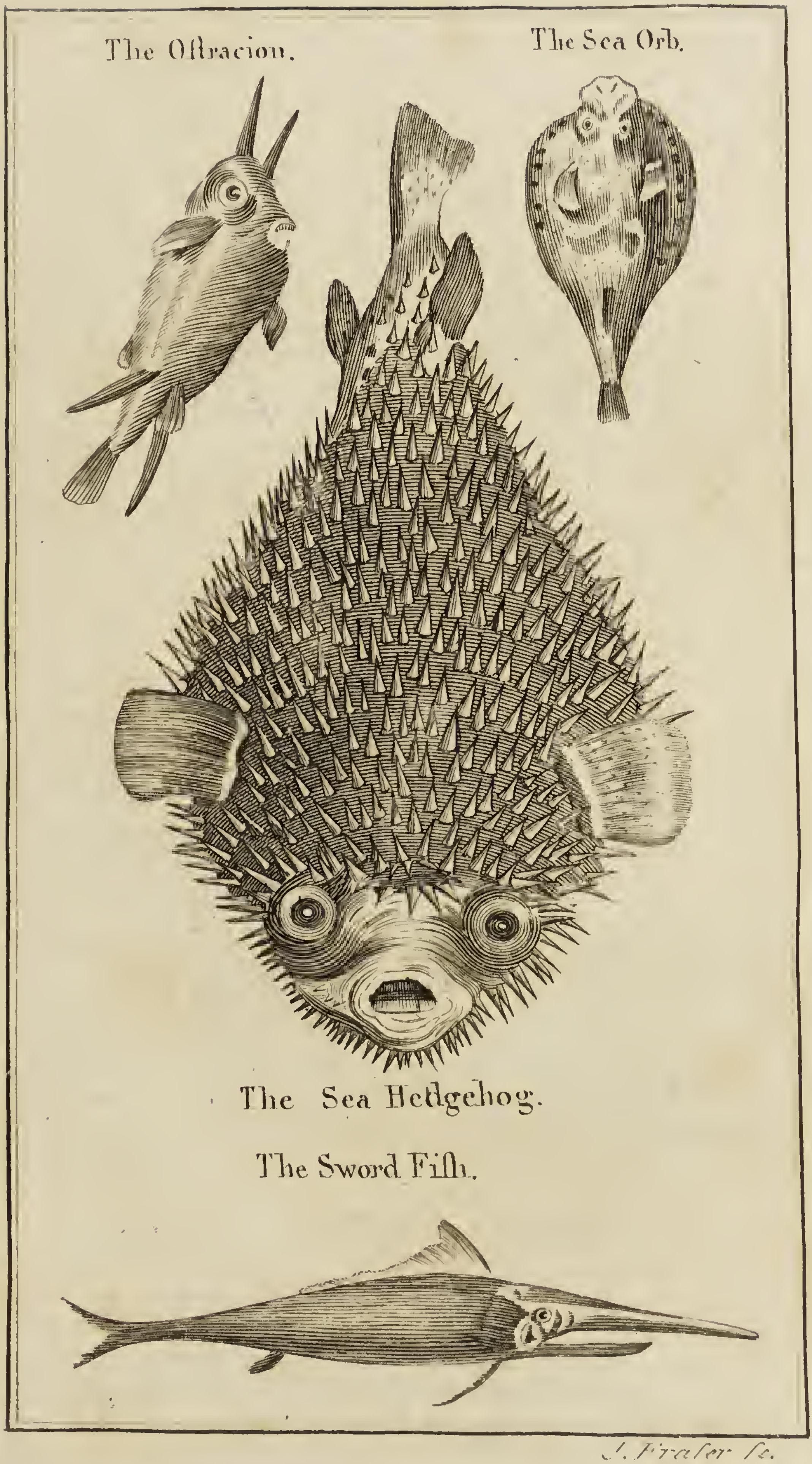
The Sea Orb.

In the firſt of this tribe we may rank the Sea Orb, which is almoſt round, has a mouth like a frog, and is from ſeven inches to two feet long. Like the porcupine, it is covered over with prickles, which point on every ſide, whence it is ſometimes called the Sea porcupine; and, when it is enraged, it can blow up its body as round as a bladder. Of this extraordinary creature there are many kinds. Some threatening only with ſpines, as the SEA HEDGE HOG; others defended with a bony helmet that covers the head, as the OSTRACION, &c.

Of theſe ſcarce one is without its peculiar weapon of offence. The centriſcus wounds with its ſpine, the oſtracions poiſon with its venom; the orb is impregnable, and is abſolutely poiſonous, if eaten.

Theſe frightful animals are of different ſizes; ſome not bigger than a foot ball, and others as large as a buſhel. The Americans often amuſe themſelves with catching theſe frightful creatures by a line and hook baited with a piece of ſea-crab. The animal approaches the bait with its ſpines flattened; but when hooked and ſtopped by the line, all its ſpines are inſtantly erected; the whole body being armed in ſuch a manner at every point, that it is impoſſible to lay hold of it on any part. For this reaſon it is dragged to ſome diſtance from the water, where it quickly expires. In the middle of the belly of all theſe there is a ſort of bag or bladder filled with air, by the inflation of which the animal ſwells itſelf in the manner already mentioned.

Plate 33.



The Oſtracion.

The Sea Orb.

The Sea Hedgehog.

The Sword Fiſh.

J. Fraser sc.

The Galley Fiſh.

To theſe animals we may add the galley fiſh, which Linnæus degrades into the inſect tribe, under the title of the Meduſa. To the eye of a careleſs ſpectator, this fiſh ſeems a tranſparent bubble ſwimming on the ſurface of the ſea, or like a bladder variouſly and beautifully painted with vivid colours, where red and violet predominate, as variouſly oppoſed to the beams of the ſun. It is, however, an actual fiſh; the body of which is compoſed of cartilages, and a very thin ſkin filled with air, which keeps the animal floating on the ſurface, at the pleaſure of the winds and waves. Perſons who happen to be walking along the ſhore often happen to tread upon theſe animals; and the burſting of their body yields a report as when one treads upon the ſwim of a fiſh. It has eight broad feet with which it ſwims, or which it expands to catch the air as with a ſail. It faſtens itſelf to whatever it meets by its legs, which have an adheſive quality. But what is moſt remarkable in this extraordinary creature, is the violent pungency of the ſlimy ſubſtance, with which its legs are ſmeared. If the ſmalleſt quantity but touch the ſkin, its quality is ſo cauſtic, that it burns like hot oil dropped on the part affected. The pain is moſt violent in the heat of the day, but ceaſes in the cool of the evening.

CHAP. XXXI.

OF SPINOUS FISHES IN GENERAL—OF FISH OF PASSAGE—THE SALMON—SHAD—SMELT—FLOUNDER, &C.——THE COD—COD FISHING—THE HADDOCK—THE WHITING—THE MACKAREL—THE HERRING—GROWTH OF FISHES—THE DORADO—THE FLYING FISH—THE PIKE—DISEASES OF FISHES—POISONOUS QUALITY.

THE third general diviſion of fiſhes is into that of the Spinous or bony kind. Theſe are obviouſly diſtinguiſhed from the reſt by having a complete bony covering to their gills; by their breathing with their gills only; by their bones which are ſharp and thorny; and their tails, which are placed in a ſituation perpendicular to the body.

As this order is extremely numerous, it has been divided by a French naturaliſt, Mr Gouan, into two grand diviſions, and theſe again into ſub-diviſions.

PRICKLY-FINNED FISHES.

PRICKLY-FINNED APODAL FISHES.

1. *THE Trichurus.* The body of this fiſh is of a ſword-form: the head is oblong: the teeth are ſword-like, bearded near the points: the fore-teeth are largeſt: the fin that covers the gills with ſeven ſpines: the tail ending in a point without fins: an inhabitant near the Oriental and American ſhores; of a ſilvery white; frequently leaping into the fiſhermen's boats in China.

2. *The Xiphias*, or *Sword-fiſh*, has the body round, the head long, the upper jaw terminating by a long beak, in the form of a ſword. A fin with ſix ſpines covers its gills. It is an inhabitant of Europe; and an enemy to the whale.

3. *The Ophidium*, *Dorado*, or *Gilthead*. The body is ſword-like: the head is blunt: the fin covering the gills with ſeven ſpines: the opening of the mouth is ſide-ways: the fins of the back, the anus, and the tail, all join together. It is the moſt beautiful of all fiſhes, covered over with green, gold, and ſilver. The ſailors call it dolphin, and it chaces the flying fiſh.

PRICKLY-FINNED JUGULAR FISHES.

4. *The Trachinus*, or *Weever*. The body is oblong. The head is obtuſe. The bones covering the gills are jagged at the bottom: the fins covering the gills have ſix ſpines. The anus near the breaſt; buries itſelf in the ſands, leaving only its noſe out; and if troden upon, immediately ſtrikes with the ſpines that form its dorſal fins, which are venomous and dangerous.

5. *The Uranoſcopus*. The body is wedge-like: the head is almoſt round, and larger than the body. The mouth is flat: the eyes are on the top of the head: the fin that covers the gills has five ſpines: the anus is in the middle of the body; and it is an inhabitant of the Mediterranean Sea.

6. *The Callyonymus*, or *Dragonet*. The body is almoſt wedge-like: the head is broad, and larger than the body: the mouth is even with the body: the bony covering of the gills are cloſe ſhut: the opening to the gills is behind the head; the fin covering the gills has ſix ſpines; and is an inhabitant of the Atlantic Ocean.

7. *The Blennius*, or *Blenny*. The body is oblong: the head is obtuſely bevil: the teeth are a ſingle range: the fin covering the gills has ſix ſpines: the ventral fins have two ſmall blunt bones in each. A ſpecies of this animal is viviparous.

PRICKLY-FINNED THORACIC FISHES.

8. *The Gobius*, or *Gudgeon*. The body is round and oblong. The head has two little holes between the eyes, one before the other: the fin covering the gills has ſix ſpines; and the ventral fins are joined together.

9. *The Cepola*. The body is ſword-like. The head is blunt: the mouth is flat: the fin covering the gills has ſix ſpines; the fins are diſtinct; and it is an inhabitant of the Mediterranean Sea.

10. *The Coryphæna*, or *Razor-fiſh*. The body is wedge-like; the head is very bevil: the fin covering the gills has five ſpines.

11. *The Scomber*, or *Makarel*. The body is oblong: the line running down the ſide is zigzagged towards the tail: the head is ſharp and ſmall: the fins covering the gills have ſix ſpines: and there are ſeveral falſe fins towards the tail.

12. *The Labrus*, or *Wraſſe*. The body is oval: the head is middling: the lips are doubled inward. It has both cutting and grinding teeth: the covers of the gills are ſcaly: the fin covering the gills have five ſpines: the pectoral fins are pointed.

13.

13. *The Sparus*, or *Sea-bream*. The body is oblong: the head is middling: the lips are not inverted; the teeth are cutting and grinding: the cover of the gills are ſcaly: the fins covering the gills have five rays; and the pectoral fins are pointed.

14. *The Chætodon*, or *Cat-fiſh*. The body is oblong: the head is ſmall: the teeth are ſlender and bending: the fin covering the gills has five or ſix ſpines: the fins of the back and anus are ſcaly.

15. *The Sciæna*. The body is nearly elliptical: the head is bevil: the covers of the fins are ſcaly: the fin covering the gills has ſix rays: the fins of the back are jagged, and hidden in a furrow in the back.

16. *The Perch*. The body is oblong: the head bevil: the covers of the gills ſcally and toothed: the fin covering the gills has ſeven ſpines: the fins in ſome are jagged.

17. The *Scorpæna*, or *Father-laſher*. The body is oblong: the head is great, with beards: the covers of the gills are armed with prickles: the fin covering the gills has ſeven ſpines.

18. *The Mullus*, or *Surmulet*. The body is ſlender: the head is almoſt four-cornered: the fin covering the gills has three ſpines. Some of theſe have beards: a fiſh highly prized by the Romans, and ſtill conſidered as a very great delicacy.

19. *The Trigla*, or the *Gurnard*. The body is ſlender: the head nearly four-cornered, and covered with a bony coat: the fin covering the gills has ſeven ſpines: the pectoral and ventral fins are ſtrengthened with additional muſcles and bones, and are very large for the animal's ſize.

20. *The Cottus*, or *Bull-head*. The body is wedge-like: the head is flat and broader than the body: the fin covering the gills has ſix ſpines: the head is furniſhed with prickles, knobs and beards.

21. *The Zeus*, or *Doree*. The body is oblong: the head is large and bevil: the fin covering the gills has ſeven rays; the fins jagged: the upper jaw has a looſe floating ſkin depending into the mouth.

22. *The Thrachipterus*, or *Sabre*. The body is ſword-like: the head bevil: the fin covering the gills has ſix ſpines: the lateral line ſtraight: the ſcales are in a ſingle order: a looſe ſkin is in both jaws.

23. *The Gaſteroſteus*, or *Stickleback*. The body is broadeſt towards the tail: the head is oblong: the fin covering the gills has three ſpines; and its prickles ſtart backward before the back fins and the fins of the anus.

PRICKLY-FINNED ABDOMINAL FISH.

24. *The Silurus*, or *Sheat-fiſh*. The body is oblong: the head large: the fin covering the gills has from four to fourteen ſpines: the leading bones or ſpines in the back and pectoral fins are toothed.

25. *The Mugil*, or *Mullet*. The body is oblong: the head is almoſt conical: the upper jaw has a furrow, which receives the prominence of the under; the fin covering the gills has ſeven rays.

26. *The Polynemus*. The body is oblong: the head has a beak: the fin covering the gills has from five to ſeven ſpines. The bones that move the pectoral fins articulated to thoſe fins.

27. *The Theutys*. The body is almoſt elliptical: the head is abruptly ſhortened: the fin covering the gills has five rays: the teeth are in a ſingle row, cloſe, ſtrong, and even.

28. *The Elops*, or *Sea-ſerpent*. The body is ſlender: the head is large; the fin covering the gills is double and has thirty ſpines, and is armed externally with five bones like teeth.

SOFT-FINNED FISHES.

SOFT-FINNED APODAL FISHES.

29. *THE Muræna*, or *El.* The body is round and ſlender: the head terminates in a beak; the fin covering the gills has ten rays: the opening to the gills is placed near the pectoral fins; the fins of the back, the anus, and the tail, unite in one.

30. *The Gymnotus*, or *Carapo*. The body is broadeſt on the back, like the blade of a knife: the head is ſmall: the fin covering the gills has five rays. This fiſh has no fins on the back but it has two beards or filaments from the upper lip, and is an inhabitant of Braſil.

31. *The Anarhicas*, or *Wolf-fiſh*. The body is roundiſh and ſlender; the head is large and blunt: the fore-teeth above and below are conical: the grinding teeth and thoſe in the palate are round: and the fin covering the gills has ſix rays.

32. *The Stromateus*. The body is oblong: the head is ſmall: the teeth are moderately ſharp: the fin covering the gills has five or ſix rays.

33. *The Ammodytes*, or *Launce*. The body is ſlender and roundiſh; the head is terminated by a beak: the teeth are of a hair-like fineneſs: and the fin covering the gills has ſeven rays.

SOFT-FINNED JUGULAR FISHES.

34. *The Lepadogaſter*. The body is wedge-like: the head oblong, forwarder than the body, flattiſh, the beak reſembles that of a duck: the pectoral fins are double, two on each ſide: the ventral fins are joined together. There is a kind of bony breaſt-plate between the pectoral fins: the fin covering the gills has five rays.

35. *The Gadus*, or *Cod-fiſh*. The body is oblong: the head wedge-like: the fin covering the gills has ſeven rays. This fiſh has ſeveral back and anal fins.

SOFT FINNED THORACIC FISHES.

36. *The Plemonecles*, or *Flumide*. The body is elliptical: the head ſmall: both eyes are on one ſide of the head: the fin covering the gills has from four to ſeven rays.

37. *The Echeneis*, or *Sucking-fiſh*. The body is almoſt wedge-like, moderately round: the head is broader than the body: the fin covering the gills has ten rays. Its breaſt-plate is of an oval form, ſtreaked like a ladder, and toothed.

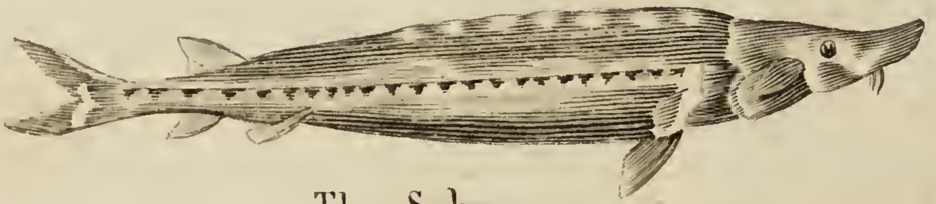
38. *The Lipidopus*, or the *Garter-fiſh*. The body is ſword-like: the head lengthened out: the fins covering the gills have ſeven rays. It has three ſcales only on the whole body; two in the place of the ventral fins; the third from that of the anus.

SOFT-FINNED ABDOMINAL FISHES.

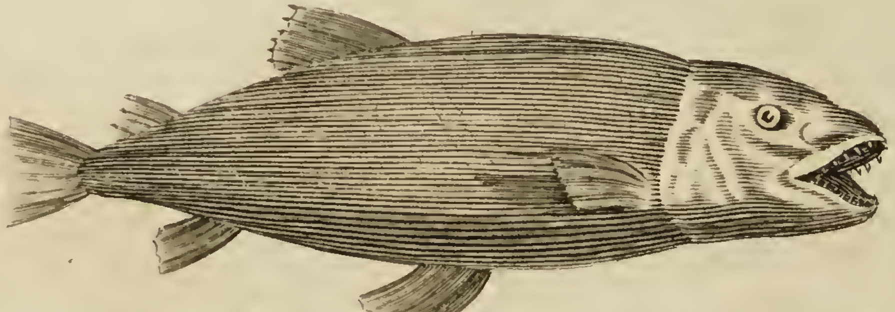
39. *The Loricaria*. The body is cruſted over: the head broad, with a beak. It has no teeth: the fin covering the gills has ſix rays.

Plate 34.

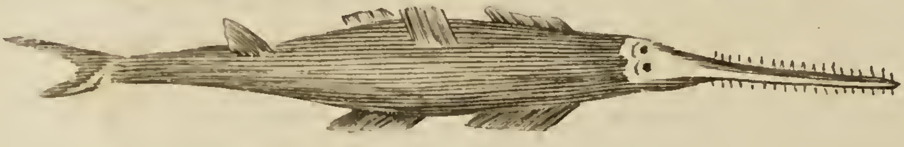
The Sturgeon.



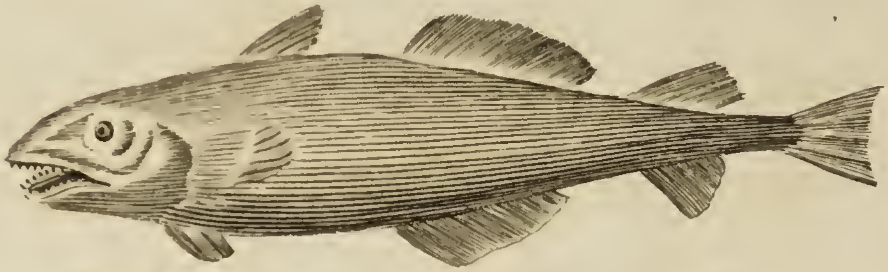
The Salmon.



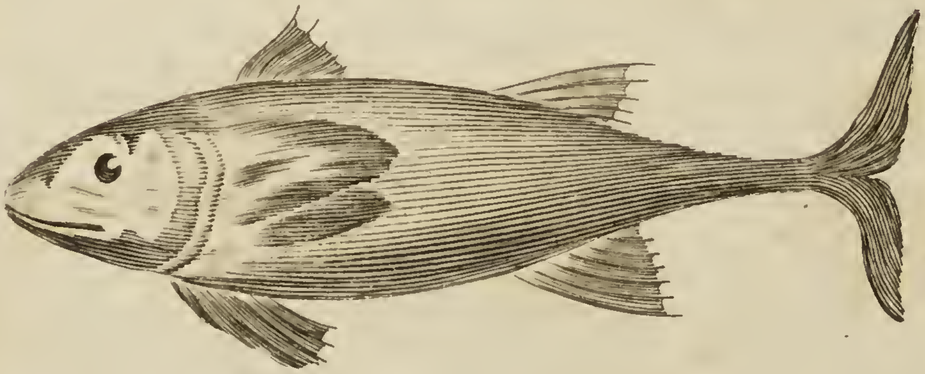
The Saw Fiſh *a Species of the Sword Fiſh.*



The Cod.



The Tunny *a Species of the Scomber.*



J. Fraſer ſc.

40. *The Atherina*, or *Atherine.* The body is oblong: the head is of a middling ſize: the lips are indented: the fin covering the gills has ſix rays: the line on the ſides reſembles a ſilver band.

41. *The Salmo*, or *Salmon.* The body is oblong: the head is a little ſharp: the fin covering the gills has from four to ten rays: the laſt fin on the back, has no correſpondent muſcles.

42. *The Fiſtularia.* The body is angular, in form of a ſpindle: the head is pipe-faſhion, with a beak; the fin covering the gills has ſeven rays: the under jaw covers the upper.

43. *The Eſox*, or *Pike.* The body is round: the head has a beak: the under-jaw pierced longitudinally has ſmall holes: the fin covering the gills has from ſeven to twelve rays.

44. *The Argentina*, or *Argentine.* The body is a little round and ſlender. The head has a beak, broader than the body: the fin covering the gills has eight rays. The back fin is ſpurious.

45. *The Clupea*, or *Herring.* The body is a little oblong: the head has a ſmall beak: the fin covering the gills have eight rays.

46. *The Exocetas*, or *Flying-fiſh.* The body is oblong: the head almoſt three-cornered: the fin covering the gills has ten rays: the pectoral fins are placed high, and as long as the whole body. The back fin is at the extremity of the back.

47. *The Cyprinus*, or *Carp.* The head has a ſmall beak: the hinder part of the bone covering the gills is marked with a creſcent: the fin covering the gills has three rays.

48. *The Cobitis*, or *Loach.* The body is oblong; and almoſt equally broad throughout. The head is ſmall, a little elongated The eyes are in the hinder part of the head: the fin covering the gills has from four to ſix rays: the covers of the gills are cloſed below.

49. *The Amia*, or *Bonito.* The body is round and ſlender; the head, forehead, and breaſt, have no ſkin: the fin covering the gills has twelve rays; and it has two beards from the noſe.

50. *The Mormyrus.* The body is oblong: the head is elongated: the fin covering the gills has a ſingle ray. The opening to the gills is linear, and has no bone covering them.

Such is the ſyſtem of Mr Gouan; to which if we reduce any fiſh, we can know its rank, its affinities, and part of its anatomy; all which make a conſiderable part in its natural hiſtory. But, to ſhew the uſe of this ſyſtem ſtill more clearly, ſuppoſe I meet with a fiſh, of which I know not the name, and of which I deſire to know ſomething more. The way is, firſt to know whether it be a cartilaginous fiſh, which it is if it want fins to open and ſhut the gills, which the cartilaginous kinds are wholly without. If I find that it has them, then it is a ſpinous fiſh; and, in order to know its kind, I examine its fins, whether they be prickly or ſoft. If I find them ſoft; it is to be ranked among the ſoft finned fiſhes. I then examine its ventral, or belly-fins, and finding that the fiſh has them, I look for their ſituation, and find they lie nearer to the tail than to the pectoral fins. By this I find the animal to be a ſoft-finned abdominal fiſh. Then, to know which of the kinds of theſe fiſhes it is, I examine its figure and the ſhape of its head. I find the body rather oblong; the head with a ſmall beak; the lower jaw like a ſaw; the fin covering the gills with eight rays. This animal muſt therefore be the herring, or one of that family; ſuch as the pilchard, the ſprat, the ſhade, or the anchovy. To give another inſtance: upon examining the fins of a fiſh with which I am unacquainted, I find them prickly; I then look for the ſituation of the ventral fins; I find them entirely wanting. This, then, muſt be a prickly-finned apodal fiſh. Of this kind there are but three; and, by comparing the fiſh with the deſcription, I find it either of the trichurus kind, the ſword-fiſh, or the gilt-head. Upon examining alſo its internal ſtructure, I ſhall find a very great likeneſs between my fiſh and that placed at the head of the family.

Having given a method by which Spinous Fiſhes may be diſtinguiſhed from each other, the hiſtory of each in particular might naturally be expected to follow: but ſuch a diſtinct account of each would be very diſguſting, from the unavoidable uniformity of every deſcription. The hiſtory of any one of this claſs very much reſembles that of all the reſt. They breathe air and water through the gills. They live by rapine, each devouring ſuch animals as its mouth is capable of admitting; and they propagate, not by producing their young alive, as in the cetaceous tribes, nor by diſtinct eggs, as in the generality of the cartilaginous tribes, but by ſpawn, or peaſe, as they are generally called, which they produce by hundreds of thouſands.

The bones of this claſs of fiſhes, when examined but ſlightly, appear to be entirely ſolid; yet, when viewed more cloſely, every bone will be found hollow, and filled with a ſubſtance leſs rancid and oily than marrow. Theſe bones are very numerous, and pointed; and, as in quadrupeds, are the props or ſtays to which the muſcles are fixed, which move the different parts of the body.

The number of bones in all ſpinous fiſhes of the ſame kind, is always the ſame. It is a vulgar way of ſpeaking, to ſay, that fiſhes are at ſome ſeaſons more bony than at others; but this ſcarce requires contradiction. It is true, that fiſh are at ſome ſeaſons much fatter than at others. Hence the quantity of the fleſh being diminiſhed, and that of the bones remaining the ſame, they appear to increaſe in number, as they actually bear a greater proportion.

As the ſpinous fiſh partake leſs of the quadruped in their formation than any others, ſo they can bear to live out of their own element a ſhorter time. Some, indeed, are more vivacious in air than others. The eel will live ſeveral hours out of water; and the carp has been known to be fattened in a damp cellar. The method is, by placing it in a net well wrapped up in wet moſs, the mouth only out, and then hung up in a vault. The fiſh is fed with white bread and milk, and the net now and then plunged into the water.

Yet it is impoſſible to account for the different operations of the ſame element upon animals, that appear to have the ſame conformation. To ſome fiſhes, bred in the ſea, freſh water is immediate deſtruction. On the other hand, ſome fiſhes, that live in our lakes and ponds, cannot bear the ſalt water. This circumſtance may poſſibly ariſe from the ſuperior weight of the ſea water. As, from the great quantity of ſalt diſſolved in its compoſition, it is much heavier than freſh water, ſo it is probable it lies with greater force upon the organs of reſpiration, and gives them their proper and neceſſary play. On the contrary, thoſe fiſh which are uſed only to freſh water, cannot bear the weight of the ſaline fluid, and expire in a manner ſuffocated in the groſſneſs of the ſtrange element.

There are ſome tribes, however, that ſpend a part of their ſeaſon in the one, and a part in the other. Thus the *ſalmon*, the *ſhad*, the *ſmelt*, and the *flounder*, annually quit their native ocean, and come up our rivers to depoſit their ſpawn. This ſeems the moſt important buſineſs of their lives; and there is no danger which they will not encounter, even to the ſurmounting precipices, to find a proper place for the depoſition of their future offspring. The ſalmon, upon theſe occaſions, is ſeen to aſcend rivers five hundred miles from the ſea, and to brave, not only the danger of various enemies, but alſo to ſpring up cataracts as high as a houſe. As ſoon as they come to the bottom of the torrent, they ſeem diſappointed to meet the obſtruction, and ſwim ſome paces back. They then take a view of the danger that lies before them, ſurvey it motionleſs for ſome minutes, advance, and again retreat. At laſt, however, ſummoning up all their force, they take a leap from the bottom, their body ſtraight, and ſtrongly in motion; and thus moſt frequently clear every obſtruction. It ſometimes, happens, that they want ſtrength to make the leap; and then, in our fiſheries, they are taken in their deſcent. But the length of the voyage performed by theſe fiſhes, is ſport, if compared to what is annually undertaken by ſome tribes that conſtantly reſide in the ocean. Of this kind are the cod, the haddock, the whiting, the mackarel, the tunny, the herring, and the pilchard.

The Cod.

The cod appears to be the foremoſt of this wandering tribe; and is only found in our northern part of the world. This animal's chief place of reſort is on the banks of Newfoundland, and the other ſand banks that lie off Cape-Breton. That extenſive flat ſeems to be no other than the broad top of a ſea-mountain, extending above five hundred miles long, and ſurrounded with a deeper ſea. Thither the cod annually repair in numbers beyond the power of calculation, to feed on the quantity of worms that are to be found in the ſandy bottom. They are taken in ſuch quantities, that they ſupply all Europe with a conſiderable ſhare of proviſion. The Engliſh have ſtages erected all along the ſhore for ſalting and drying them; and the fiſhermen, who take them with the hook and line, draw them in as faſt as they can throw out. This immenſe havock, however, makes but a very ſmall diminution, when compared to their numbers; and when their proviſion there is exhauſted, or the ſeaſon for propagation returns, they go off to the polar ſeas, where they depoſit.

The *Haddock*, the *Whiting*, and the *Mackarel*, are thought, by ſome, to be driven upon our coaſts rather by their fears than their appetites; and it is to the purſuit of the larger fiſhes, we owe their welcome viſits. It is much more probable, that they come for that food which is found in more plenty near the ſhore, than farther out at ſea. The limits of a ſhoal are preciſely known; for if the fiſhermen put down their lines at the diſtance of more than three miles from ſhore, they catch nothing but dog-fiſh: a proof that the haddock is not there.

The Herring and the Pilchard.

Of all migrating fiſh, the herring and the pilchard take the moſt adventurous voyages. Herrings abound moſt in the higheſt northern latitudes. In thoſe inacceſſible ſeas, that are covered with ice for a great part of the year, the herring and pilchard find a quiet and ſure retreat from all their numerous enemies. Thither neither man, nor their ſtill more deſtructive enemy, the fin-fiſh, or the cachalot, dares to purſue them. The quantity of inſect food which thoſe ſeas ſupply, is very great; whence, in that remote ſituation, defended by the icy rigour of the climate, they live at eaſe, and multiply exceedingly faſt. From this moſt deſirable retreat, Anderſon ſuppoſes they would never depart, but that their numbers render it neceſſary for them to migrate; and, as bees from a hive, they are compelled to ſeek for other retreats.

For this reaſon, the great colony is ſeen to ſet out from the icy ſea about the middle of winter; compoſed of moſt incredible numbers. But they no ſooner leave their retreats, but millions of enemies appear to thin their ſquadrons. The fin-fiſh and the cachalot ſwallow numbers at a yawn. The porpeſſes, the grampus, the ſhark, and the whole numerous tribe of dog-fiſh, find them an eaſy prey, and deſiſt from making war upon each other. Beſides the unnumbered flocks of ſea-fowl that chiefly inhabit near the pole, watch the outſet of their dangerous migration, and ſpread extenſive ruin.

In this exigence, the defenceleſs emigrants find no other ſafety but by crouding cloſer together, and leaving to the outmoſt bands the danger of being the firſt devoured. Thus, like ſheep when frighted, that always rnn together in a body, and each finding ſome protection in being but one of many that are equally liable to invaſion, they are ſeen to ſeparate into ſhoals, one body of which moves to the weſt, and pours down along the coaſts of America, as far ſouth as Carolina, and but ſeldom farther. In Cheſapeak Bay, the annual innundation of theſe fiſh is ſo great, that they cover the ſhores in ſuch quantities as to become a nuiſance. Thoſe that hold more to the eaſt, and come down towards Europe, endeavour to ſave themſelves from their mercileſs purſuers, by approaching the firſt ſhore they can find. And that which firſt offers in their deſcent, is the coaſt of Iceland, in the beginning of March. Upon their arrival on that coaſt, their phalanx, which has already ſuffered conſiderably, is nevertheleſs of amazing extent, depth, and cloſeneſs, covering an extent of ſhore as large as the iſland itſelf. The whole water ſeems alive; and is ſeen black to a great diſtance.

That body which comes upon our coaſts, begins to appear off the Shetland Iſles in April. Theſe are the fore-runners of the grand ſhoal which deſcends in June; while its arrival is eaſily announced, by the number of its greedy attendants, the gannet, the gull, the ſhark, and the porpeſſes. When the main body is arrived, its breadth and depth is ſuch as to alter the very appearance of the ocean. It is divided into diſtinct columns, of five or ſix miles long, and three or four broad; while the water before them curls up, as if forced from its place. Sometimes they ſink for the ſpace of ten or fifteen minutes, then riſe again to the ſurface; and, in bright weather, reflect a variety of ſplendid colours, like a field beſpangled with purple, gold and azure. The fiſhermen are ready prepared to give them a proper reception; and, by nets made for the occaſion, they take ſometimes above two thouſand barrels at a draught.

The manner in which the eggs of fiſhes are impregnated is wholly unknown. All that obviouſly offers is, that in ponds the ſexes are often ſeen together among the long graſs at the edge of the water; that there they ſeem to ſtruggle; and that during this time they are in a ſtate of ſuffering; they grow thin; they loſe their appetite, and their fleſh becomes flabby; the ſcales of ſome grow rough, and they loſe their luſtre. On the contrary, when the time of coupling is over, their appetite returns; they re-aſſume their natural agility, and their ſcales become brilliant and beautiful.

The power of increaſing in theſe animals, exceeds our idea, as it would, in a very ſhort time, outſtrip all calculation. Although the uſual way with ſpinous fiſhes is to produce by ſpawn; yet there are ſome, ſuch as the eel and the blenny, that are known to bring forth their young alive.

With reſpect to the growth of fiſhes, it is obſerved, that among carps, particularly the firſt year, they grow to about the ſize of the leaf of a willow tree; and at two years, they are about four inches long. They grow but one inch more the third ſeaſon, which is five inches. Thoſe of four years old are about ſix inches; and ſeven after the fifth. From that to eight years old they are found to be large in proportion to the goodneſs of the pond, from eight to twelve inches. With regard to ſea-fiſh, the fiſhermen aſſure us that a fiſh muſt be ſix years old before it is fit to be ſerved up to table. They inſtance it in the growth of a mackarel. They aſſure us that thoſe of a year old are as large as one's finger; that thoſe of two years, are about twice that length; at three and four years, they are that ſmall kind of mackarel that have neither milts nor rows; and between five and ſix, they are thoſe full grown fiſh that are ſerved up to our tables. In the ſame manner, with regard to flat fiſhes, they tell us that the turbot and barble at one year are about the ſize of a crown piece; the ſecond year as large as the palm of one's hand; and at the fifth and ſixth year, they are large enough to be ſerved up to table. Thus it appears that fiſh are a conſiderable time in arriving at their full growth, and that they are a long time deſtroyed before it comes to their turn to be deſtroyers*.

All fiſh live upon each other, in ſome ſtate of their exiſtence. Thoſe with the largeſt mouths, attack and deſtroy the largeſt kinds; thoſe whoſe mouths are leſs, lie in wait for the ſmaller fry; and even theſe chiefly ſubſiſt upon ſpawn. Of thoſe which live in the ocean of the ſpinous kinds, the DORADO is the moſt voracious. This is chiefly found in the tropical climates; and is at once the moſt active, and the moſt beautiful of the finny race. It is about ſix feet long. The back is all over enamelled with ſpots of a bluiſh green and ſilver. The tail and fins are of a gold colour; and all have a brilliancy of tint, that nothing but Nature's pencil can attain to. The eyes are placed on each ſide of the head, large and beautiful, ſurrounded with circles of ſhining gold. In the ſeas where they are found, theſe fiſh are always in motion, and play round ſhips in full ſail, with eaſe and ſecurity. They are always either purſuing or purſued, they are ſeen continually in a ſtate of warfare; either defending themſelves againſt the ſhark, or darting after the ſmaller fiſhes. Above all others, the FLYING-FISH moſt abounds in theſe ſeas; and as it is a ſmall animal, ſeldom growing above the ſize of a herring, it is chiefly ſought by the dorado. Nature has furniſhed each reſpectively with the powers of purſuit and evaſion. The dorado being above ſix feet long, yet not thicker than a ſalmon, and furniſhed with a full complement of fins, cuts its way

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* Traite des Peches, par Monſieur Duhamel. Sect. 3. p. 100.

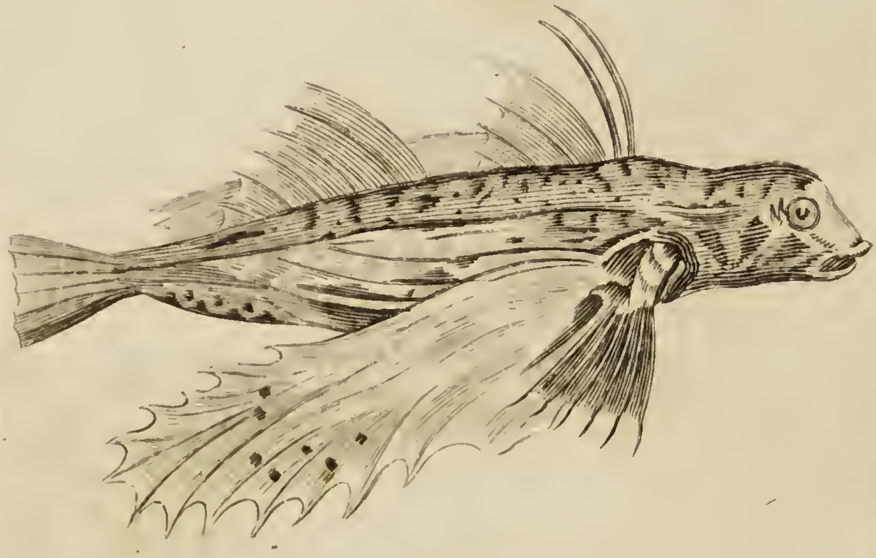
through the water with amazing rapidity. On the other hand, the flying-fiſh is furniſhed with two pair of fins longer than the body, and theſe are alſo moved by a ſtronger ſet of muſcles than any other. This equality of power ſeems to furniſh one of the moſt entertaining ſpectacles thoſe ſeas can exhibit. The efforts to ſeize on the one ſide, and the arts to eſcape on the other, are perfectly amuſing. The dorado is ſeen, upon this occaſion, darting after its prey, which will not leave the water, while it has the advantage of ſwimming, in the beginning of the chace. But, like an hunted hare, being tired at laſt, it then has recourſe to flight. The long fins, which began to grow uſeleſs in the water, are now exerted in a different manner and a different direction to that in which they were employed in ſwimming. By theſe means the timid little animal riſes from the water, and flutters over its ſurface, for two or three hundred yards, till the muſcles employed in moving the wings are enfeebled by that particular manner of exertion. By this time, however, they have acquired a freſh power of renewing their efforts in the water, and the animal is capable of proceeding with ſome velocity by ſwimming. But ſtill the active enemy keeps it in view, and drives it again from the deep; till, at length the poor little creature is ſeen to dart to ſhorter diſtances, to flutter with greater effort, and to drop down at laſt into the mouth of its fierce purſuer. Not the dorado alone, but all animated nature ſeems combined againſt this little fiſh, which appears to poſſeſs double powers, only to be ſubject to greater dangers. For though it ſhould eſcape its enemies of the deep, yet the tropic bird and the albatroſs are for ever upon the wing to ſeize it. Thus purſued in either element, it ſometimes ſeeks refuge from a new enemy; and it often happens that whole ſhoals of them fall on ſhipboard, where they furniſh man with an object of uſeleſs curioſity.

The greedineſs with which ſea-fiſh devour the bait is prodigious, if compared with the manner they take it in freſh water. The lines of ſuch fiſhermen as go to ſea, are coarſe, thick and clumſy, in compariſon of thoſe which are uſed in rivers. Their baits are ſeldom more than a a piece of fiſh, or the fleſh of ſome quadruped, ſtuck on the hook in a bungling manner; and ſcarce any art is employed to conceal the deception. But it is otherwiſe in freſh water; the lines muſt often be drawn to an hair-like fineneſs; they muſt be tinctured of the peculiar colour of the ſtream; the bait muſt be formed with the niceſt art, and even if poſſible to exceed the perfection of nature. Notwithſtanding this, the fiſhes approach it with diffidence, and often ſwim round it with diſdain. The cod, on the banks of Newfoundland, the inſtant the hook, which is only baited with the guts of the animal laſt taken, is dropped into the water, darts to it at once, and the fiſhermen have but to pull up as faſt as they throw down. But it is otherwiſe with thoſe who fiſh in freſh waters, they muſt wait whole hours in fruitleſs expectation; and *the patience of fiſhermen* is proverbial among us.

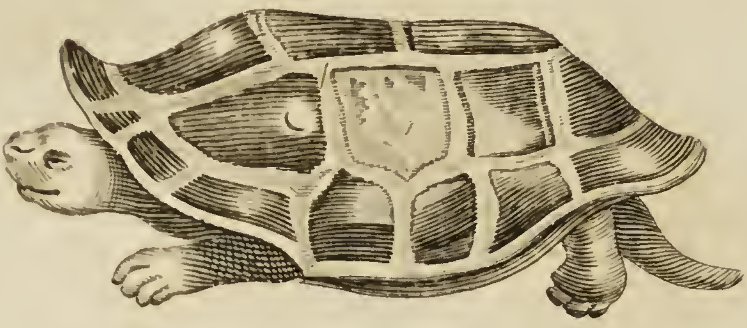
This comparative neglect of food, which is found in all the tribes of freſh water fiſhes, renders them leſs turbulent and leſs deſtructive among each other. Of all theſe the Pike is the moſt active and voracious; and our poets, whoſe buſineſs it is to obſerve the ſurface of nature, have called it the tyrant of the watery plain. The pike will attack every fiſh leſs than itſelf; and it is ſometimes ſeen choaked, by attempting to ſwallow ſuch as are too large. It is no matter of what

Plate 35.

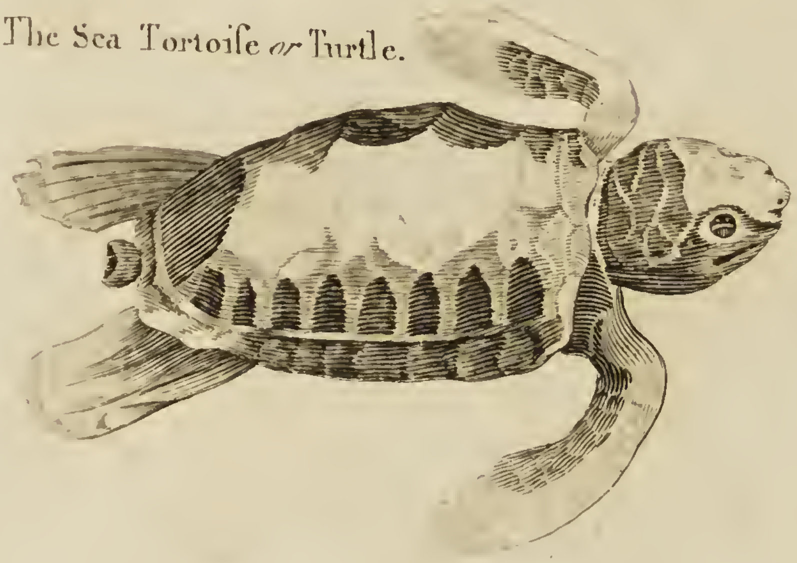
The Flying Fiſh.



The Land Tortoiſe.



The Sea Tortoiſe *or* Turtle.



J. Fraser sc.

ſpecies the animal it purſues appears to be, whether of another or of its own. All are indiſcriminately devoured. Every fiſh, therefore, owes its ſafety to its minuteneſs, its celerity, or its courage: nor does the pike confine itſelf to feed on fiſh and frogs. It will draw down the water-rat and the young ducks, as they are ſwimming about. Geſner tells us of a mule that ſtopped to drink in the water, when a famiſhed pike, that was near, ſeized it by the noſe, nor was it diſengaged till the beaſt flung it on the ſhore. So great is their rapacity, that they will contend with the otter for its prey, and even endeavour to force it from him.

As fiſh are enemies to one another, ſo each ſpecies is infeſted with worms of different kinds, peculiar to itſelf. The great fiſh abound with them; and the little ones are not entirely free. Theſe troubleſome vermin lodge themſelves either in the jaws, and the inteſtines internally, or near the fins without. When fiſh are healthy and fat, they are not much annoyed by them; but in winter, when they are lean or ſickly, they ſuffer very much.

Nor does the reputed longevity of this claſs ſecure them from their peculiar diſorders. They are not only affected by too much cold, but there are frequently certain diſpoſitions of the element in which they reſide, unfavourable to their health and propagation. Some ponds they will not breed in, however artfully diſpoſed for ſupplying them with freſh recruits of water, as well as proviſion. In ſome ſeaſons alſo they are found to feel epidemic diſorders, and are ſeen dead by the water-ſide, without any apparent cauſe.

That ſome fiſhes in the warm climates are poiſonous when eaten, cannot be doubted. We have a paper in the Philoſophical Tranſactions, giving an account of the poiſonous qualities of thoſe found at New Providence, one of the Bahama iſlands. The author there aſſures us, that the greateſt part of the fiſh of that dreary coaſt, are all of a deadly nature. Their ſmalleſt effects being to bring on a terrible pain in the joints, which, if terminating favourably, leaves the patient without any appetite for ſeveral days after. It is not thoſe of the moſt deformed or of the moſt frightful figure, that are alone to be dreaded. All kinds, at different times, are alike dangerous; and the ſame ſpecies which has this day ſerved for nouriſhment, is the next, if tried, found to be fatal!

Happy Britain! where the ſea furniſhes an abundant and luxurious repaſt, and the freſh waters an innocent and harmleſs paſtime; where the angler, in chearful ſolitude, ſtrolls by the edge of the ſtream, and fears neither the coiled ſnake, nor the lurking crocodile. There he can retire at night, with his few trouts, to borrow the charming deſcription of old Walton, to ſome friendly cottage, where the landlady is hoſpitable, and the daughter is beautiful. The room is clean, and twenty ballads are ſtuck about the wall! There he can enjoy the company of a talkative brother ſportſman, have his trouts dreſſed for ſupper, tell tales, ſing old tunes, or make a catch! There he can talk of the wonders of nature with learned admiration, or find ſome harmleſs ſport to content him, and paſs away a little time, without offence to God, or injury to man!

CHAP. XXXII.

OF SHELL-FISH IN GENERAL—THE CRUSTACEOUS CLASS—THE LOBSTER—THE CRAB—THE LAND-CRAB—THE SOLDIER-CRAB—THE TORTOISE—THE LAND TORTOISE—THE TURTLE—OF TESTACEOUS-FISHES—OF THE TURBINATED OR SNAIL KIND—THE GARDEN SNAIL—THE FRESH-WATER-SNAIL—THE SEA-SNAIL—THE NAUTILUS—OF BIVALVED FISH—THE MUSCLE—THE OYSTER—THE COCKLE—THE SCOLLON—THE RAZOR-FISH—OF PEARLS AND THE FISHERY—OF MULTIVALVE SHELL-FISH—THE SEA-URCHIN—THE PHOLADES.

IN deſcribing the inhabitants of the water, a claſs of animals occur, that mankind, from the place of their reſidence, have been content to call fiſh; but that naturaliſts, from their formation, have juſtly agreed to be unworthy of the name. Indeed, the affinity many of this kind bear to the inſect tribe, may very well plead for the hiſtorian, who ranks them rather as inſects. However the common language of a country muſt not be ſlightly invaded; the names of things may remain, if the philoſopher be careful to give preciſion to our idea of them.

There are two claſſes of animals, inhabiting the water, which commonly receive the name of fiſhes, entirely different from thoſe we have been deſcribing, and alſo very diſtinct from each other. Theſe are divided by naturaliſts into Cruſtaceous and Teſtaceous animals. They are both totally unlike fiſhes to appearance, and ſeem to invert the order of nature; and as thoſe have their bones on the inſide, and their muſcles hung upon them for the purpoſes of life and motion; theſe, on the contrary, have all their bony parts on the outſide, and all their muſcles within. Indeed all who have ſeen a lobſter or an oyſter, perceive that the ſhell in theſe bears a ſtrong analogy to the bones of other animals; and, that, by theſe ſhells, the animal is ſuſtained and defended.

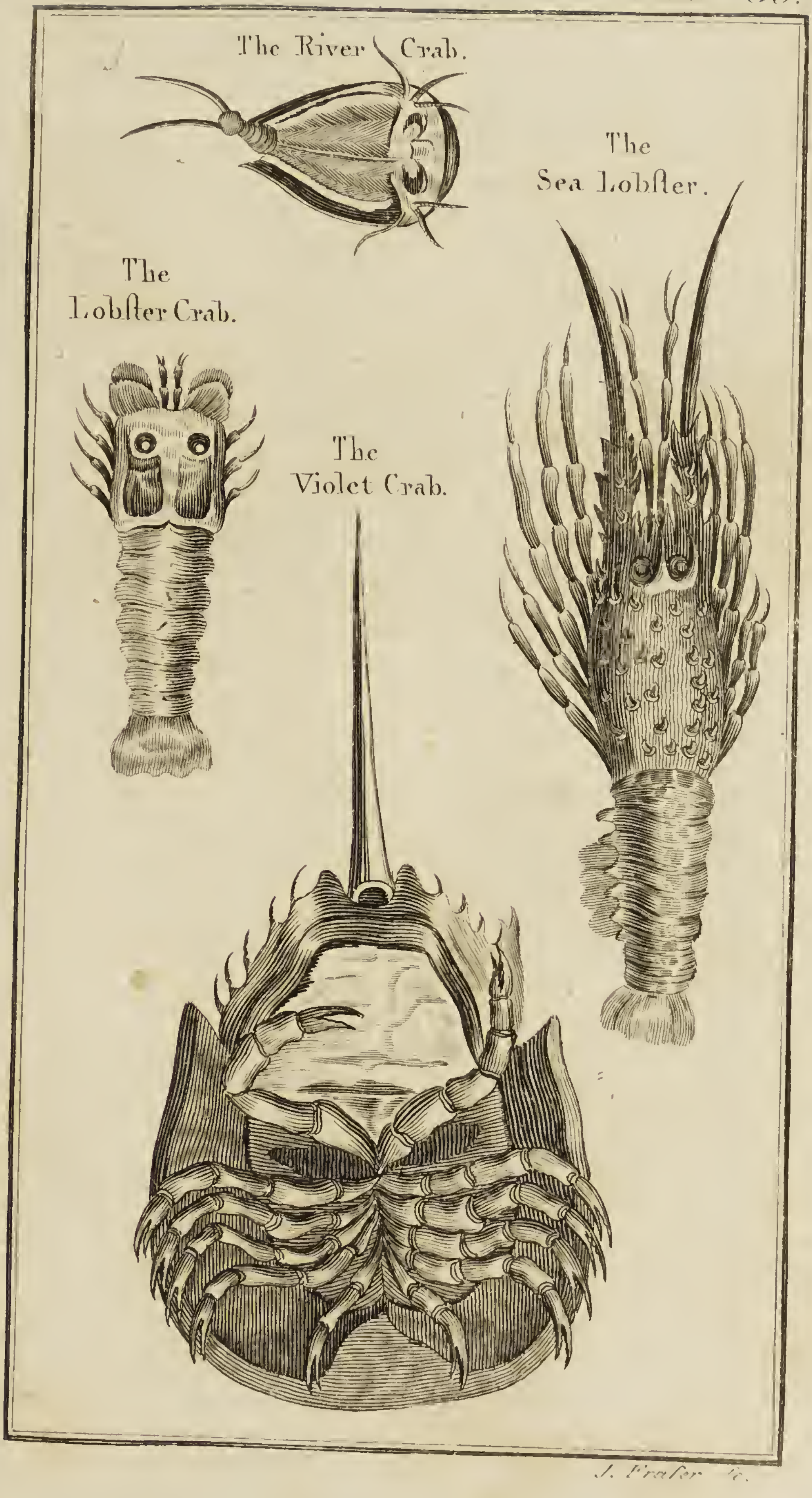
Cruſtaceous fiſh, ſuch as the crab and the lobſter, have a ſhell not quite of a ſtony hardneſs, but rather reſembling a firm cruſt, and in ſome meaſure capable of yielding. Teſtaceous fiſhes, ſuch as the oyſter or cockle, are furniſhed with a ſhell of a ſtony hardneſs; very brittle, and incapable of yielding. Of the cruſtaceous kinds are the lobſter, the crab, and the tortoiſe. Of the teſtaceous ſorts, are that infinite tribe of oyſters, muſcles, cockles, and ſea-ſnails.

The Lobſter Kind.

However different in figure the lobſter and the crab may ſeem, their manners and conformation are nearly the ſame. With all the voracious appetites of fiſhes, they are condemned to lead an inſect life at the bottom of the water; and though preſſed by continual hunger, they are often obliged to wait till accident brings them their prey. Though without any warmth in their bodies, or even without red blood circulating through their veins, they are animals wonderfully voracious. Whatever they ſeize upon that has life, is ſure to periſh. They even devour each other. But what is moſt ſingular is, they may, in ſome meaſure, be ſaid to eat themſelves; as they change their ſhell and their ſtomach every year, and their old ſtomach is generally the firſt morſel that ſerves to glut the new.

The

Plate 36.


The River Crab.
The Sea Lobſter.
The Lobſter Crab.
The Violet Crab.

J. Fraſer ſc.

The *Lobſter* is an animal of ſo extraordinary a form, that thoſe who firſt ſee it are apt to miſtake the head for the tail. It is ſoon diſcovered however, that the animal moves with its claws foremoſt; and that the part which plays within itſelf by joints, like a coat of armour, is the tail. The mouth, like that of inſects, opens the long way of the body, not croſs-ways, as with man, and the higher race of animals. It is furniſhed with two teeth for the comminution of its food; but as theſe are not ſufficient, it has three more in the ſtomach; one on each ſide, and the other below. Between the two teeth there is a fleſhy ſubſtance, in the ſhape of a tongue. The inteſtines conſiſt of one long bowel, which reaches from the mouth to the vent; but what this animal differs in from all others, is, that the ſpinal marrow is in the breaſt bone. It is furniſhed with two long feelers or horns, on each ſide of the head, that ſeem to correct the dimneſs of its ſight, and to apprize the animal of its danger, or of its prey. The tail, or that jointed inſtrument at the other end, is the grand inſtrument of motion; and with this it can raiſe itſelf in the water. Under this we uſually ſee lodged the ſpawn in great abundance; every pea adhering to the next by a very fine filament, which is hardly perceiveable. Every lobſter is an hermaphrodite, and is ſuppoſed to be ſelf-impregnated. The ovary, or place where the ſpawn is firſt produced, is, toward the tail, where a red ſubſtance is always found, and which is nothing but a cluſter of peas, that are two ſmall for excluſion. From this receptacle there go two canals, that open on each ſide at the jointures of the ſhell, at the belly. Through theſe the peas deſcend to be excluded, and placed under the tail, where the animal preſerves them from danger till being furniſhed with limbs and motion, they drop off into the water.

When the young lobſters leave the parent, they immediately ſeek for refuge in the ſmalleſt clefts of rocks, and in ſuch-like crevices at the bottom of the ſea, where the entrance is but ſmall, and the opening can be eaſily defended. There, without ſeeming to take any food, they grow larger in a few weeks time, from the mere accidental ſubſtances which the water waſhes to their retreats. By this time alſo they acquire an hard, firm ſhell, which furniſhes them with both offenſive and defenſive armour. They then begin to iſſue from their fortreſſes, and boldly creep along the bottom, in hopes of meeting with more diminutive plunder. The ſpawn of fiſh, the ſmaller animals of their own kind, but chiefly the worms that keep at the bottom of the ſea, ſupply them with proviſion. They keep in this manner cloſe among the rocks, buſily employed in ſcratching up the ſand with their claws for worms, or ſurpriſing ſuch heedleſs animals as fall within their graſp. They have therefore little to apprehend, except from each other; for in them, as among fiſhes, the large are the moſt formidable of all enemies to the ſmall.

But this life of abundance and ſecurity is ſoon to have a moſt dangerous interruption. The body of the lobſter ſtill continuing to increaſe, while its ſhell remains of the ſame ſize, the animal becomes too large for its habitation, and muſt get rid of it. The young of this kind, therefore, that grow faſter, as I am aſſured by the fiſhermen, change their ſhell oftener than the old, who come to their full growth, and who remain in the ſame ſhell often for two years together. In general, however, all theſe animals change their ſhell once a year; and this is not only a moſt painful operation, but alſo ſubjects them to every danger. Juſt before caſting its ſhell, it throws itſelf upon its back, ſtrikes its claws againſt each other, and every limb ſeems to tremble. Its feelers are agitated, and the whole body is in violent motion. It then ſwells itſelf in an unuſual manner, and at laſt the ſhell is ſeen to divide at its junctures. It alſo ſeems turned inſide out; and its ſtomach comes away with its ſhell. After this, by the ſame operation, it diſengages itſelf of the claws, which burſt at the joints; the animal, with a tremulous motion, caſting them off as man would kick off a boot that was too big for him.

Thus, in a ſhort time, this wonderful creature finds itſelf at liberty; but in ſo weak and enfeebled a ſtate, that it continues for ſeveral hours motionleſs. Indeed, ſo violent and painful is the operation, that many of them die under it; and thoſe which ſurvive, are in ſuch a weakly ſtate for ſome time, that they neither take food, nor venture from their retreats. Immediately after this change, they have not only the ſoftneſs, but the timidity of a worm. Every animal of the deep is then a powerful enemy, which they can neither eſcape nor oppoſe; and this, in fact, is the time when the dog-fiſh, the cod, and the ray, devour them by hundreds. But this ſtate of defenceleſs imbecility continues for a very ſhort time. The animal, in leſs than two days, is ſeen to have the ſkin that covered its body grown almoſt as hard as before: its appetite is ſeen to encreaſe; and, the firſt object that tempts its gluttony, is its own ſtomach, of which it ſo lately got rid. This it devours with great eagerneſs; and ſome time after even eats its former ſhell. In about forty eight hours, in proportion to the animal's health and ſtrength, the new ſhell is perfectly formed, and as hard as that which was but juſt thrown aſide.

When the lobſter is completely equipped in its new ſhell, it then appears how much it has grown in the ſpace of a very few days. If the dimenſions of the old ſhell be compared with thoſe of the new, it will be found that the creature is increaſed above a third in its ſize; and, like a boy that has outgrown his clothes, it ſeems wonderful how the deſerted ſhell was able to contain ſo great an animal as fills the new.

The creature thus equipped, not only with a complete covering, but alſo furniſhed with a greater ſhare of ſtrength and courage, ventures more boldly among the animals at the bottom; and not a week paſſes that in its combats it does not ſuffer ſome mutilation. A joint, or even a whole claw, is ſometimes ſnapped off in theſe encounters. At certain ſeaſons of the year theſe animals never meet without an engagement. In theſe, to come off with the loſs of a leg, or even a claw, is conſidered as no great calamity. The victor carries off the ſpoil to feaſt upon at his leaſure, while the other retires from the defeat to wait for a thorough repair. This repair is not long in making. From the place where the joint of the claw was cut away, is ſeen in a moſt ſurpriſing manner to burgeon out the beginning of a new claw. This, if obſerved, at firſt, is ſmall and tender, but grows, in the ſpace of three weeks, to be almoſt as large and as powerful as the old one. I ſay almoſt as large, for it never arrives to the full ſize. This too is the reaſon we generally find the claws of the lobſters of unequal magnitude.

Of this extraordinary yet well known animal there are many varieties, with ſome differences in the claws, but little in the habits or conformation. It is found above three feet long; and if we may admit the ſhrimp and the prawn into the claſs, though unfurniſhed with claws, it is found not above an inch. Theſe all live in the water, and can bear its abſence but a few hours. The ſhell is black when taken out of the water, but turns red by boiling. The moſt common way of taking the lobſter is in a baſket, or pot, as the fiſhermen call it, made of wicker-work, in which they put the bait, and then throw it to the bottom of the ſea, in ſix or ten fathom water. The lobſters creep into this for the ſake of the bait, but are unable to extricate themſelves. The river craw-fiſh differs little from the lobſter, only the one will live in freſh water, and the other will thrive only in the ſea.

The Crab.

The crab is found equally upon land as in the water. The Land-crab is found in ſome of the warmer regions of Europe, and in great abundance in all the tropical climates in Africa and America. They are of various kinds, and endued with various properties. Some are healthful, delicious, and nouriſhing food; others are poiſonous or malignant to the laſt degree: ſome are not above half an inch broad others are found a foot over: ſome are of a dirty brown, and others beautifully mottled. That animal called the violet crab of the Caribbee Iſlands, is the moſt noted, both for its ſhape, the delicacy of its fleſh, and the ſingularity of its manners.

The violet crab ſomewhat reſembles two hands cut through the middle and joined together; for each ſide is like four fingers, and the two nippers or claws reſemble the thumbs. All the reſt of the body is covered with a ſhell as large as a man's hand and bunched in the middle on the fore-part of which there are two long eyes of the ſize of a grain of barley, tranſparent as cryſtal and hard as horn. A little below theſe is the mouth, covered with a ſort of barbs, under which there are two broad ſharp teeth white as ſnow. They are not placed, as in other animals, croſs-ways, but in the oppoſite direction, not unlike the blades of a pair of ſciſſars. With theſe teeth they can eaſily cut leaves, fruits, and rotten wood, which they uſually feed upon. But their principal inſtrument for cutting and ſeizing their food is their nippers, which catch ſuch an hold, that the animal loſes the limb ſooner than its graſp, and is often ſeen ſcampering off, having left its claw in the enemy. The faithful claw ſeems to perform its duty, and keeps for above a minute faſtened upon the finger while the crab is making off*. In fact it loſes no great matter by leaving a leg or an arm, for they ſoon grow again, and the animal is found as perfect as before.

This however, is the leaſt ſurprizing part of this creature's hiſtory. What I am about to relate however, were it not as well known and as confidently confirmed as any other circumſtance in natural hiſtory, might ſtagger our belief. Theſe animals live not only in a kind of ſociety in their retreats in the mountains, but regularly once a year march down to the ſea-ſide in a body of ſome millions together. As they multiply in great numbers, they chuſe the months of April or May to begin their expedition; and then ſally out by thouſands from the ſtumps of hollow trees, from the clefts of rocks, and from the holes which they dig for themſelves under the ſurface of the earth. At that time the whole ground is covered with this band of adventurers. The ſea is their place of deſtination, and to that they direct their march with right-lined preciſion. No geometrician could ſend them to their deſtined ſtation by a ſhorter courſe. They neither turn to the right or left, whatever obſtacles intervene; and even if they meet with a houſe, they will attempt to ſcale the walls. But though this be the general order of their route, they upon other occaſions are compelled to conform to the face of the country; and if it be interſected by rivers, they are then ſeen to wind along the courſe of the ſtream. The proceſſion ſets forward from the mountains with the regularity of an army under the conduct of an experienced commander. They are commonly divided into three battalions; of which, the firſt conſiſts of the ſtrongeſt and boldeſt males, that like pioneers, march forward to clear the route and to encounter the greateſt dangers. Theſe are often obliged to halt for want of rain, and to go into the moſt convenient encampment till the weather changes. The main body of the army is compoſed of females, which never leave the mountains till the rain is ſet in for ſome time, and then deſcend in regular battalia, being formed into columns of fifty paces broad, and three miles deep. Three or four days after this the rear-guard follows, a ſtraggling undiſciplined tribe, of males and females, but neither ſo robuſt nor ſo numerous as the former. The night is moſt favourable for their march; but if it rains by day, they avail themſelves of it; and continue to move forward in their ſlow uniform manner. When the ſun ſhines and is hot upon the ſurface of the ground, they then make an univerſal halt, and wait till the cool of the evening. When they are terrified, they march back in a confuſed diſorderly manner, holding up their nippers, with which they ſometimes tear off a piece of the ſkin, and then leave the weapon where they inflicted the wound. They even try to intimidate their enemies; for they often clatter their nippers together, as if to threaten thoſe that come to diſturb them. But though they thus ſtrive to be formidable to man, they are much more ſo to each other; for if any of them by accident is maimed in ſuch a manner as to be incapable of proceeding, the reſt fall upon and devour it on the ſpot, and then purſue their journey.

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* Brown's Jamaica, p. 423

When after a fatiguing march, and eſcaping a thouſand dangers, for they are ſometimes three months in getting to the ſhore, they have arrived at their deſtined port, they prepare to caſt their ſpawn. The peas are as yet within their bodies, and not excluded, as is uſual in animals of this kind, under the tail; for the creature waits for the benefit of the ſea-water to help the delivery. For this purpoſe, the crab has no ſooner reached the ſhore, than it eagerly goes to the edge of the water, and lets the waves waſh over its body two or three times. This ſeems only a preparation for bringing their ſpawn to maturity; for without farther delay they withdraw to ſeek a lodging upon land. In the mean time, the ſpawn grows larger, is excluded out of the body, and ſticks to the barbs under the flap, or more properly the tail. This bunch is as big as an hen's egg, and is like the roes of herrings. In this ſtate of pregnancy, they once more ſeek the ſhore for the laſt time, and ſhaking off their ſpawn into the water, leave accident to bring it to maturity. At this time whole ſhoals of hungry fiſh are at the ſhore, and about two thirds of the crabs eggs are immediately devoured by theſe rapacious invaders. The eggs that eſcape are hatched under the ſand; and ſoon after millions at a time of theſe little crabs are ſeen to quit the ſhore, and to travel up to the mountains.

The old ones, however, are not ſo active to return. They have become ſo feeble and lean, that they can hardly creep along, and the fleſh at that time changes its colour. Moſt of them, therefore, are obliged to continue in the flat parts of the country till they recover holes in the earth, which they cover at the mouth with leaves and dirt, that no air may enter. There they throw off their old ſhells, which they leave as it were quite whole, the place where they opened on the belly being unſeen. At that time they are entirely naked, and almoſt without motion for ſix days together, when they become ſo fat as to be delicious food. They have then under their ſtomachs four large white ſtones, which gradually decreaſe in proportion as the ſhell hardens, and when they come to perfection are not to be found. Now the animal is ſeen to make its way ſlowly back; and all this is moſt commonly performed in the ſpace of ſix weeks.

The deſcent of theſe creatures for ſuch important purpoſes deſerves our admiration; but there is an animal of the lobſter kind that annually deſcends from its mountains in like manner, and for purpoſes ſtill more important and various. Its deſcent is not only to produce an offſpring, but to procure a covering; not only to ſecure a family, but to furniſh an houſe. The animal I mean is the *ſoldier-crab*, which is ſomewhat like the lobſter, if diveſted of its ſhell. It is uſually about four inches long, has no ſhell behind, but is covered down to the tail with a rough ſkin, terminating in a point. It is however armed with ſtrong hard nippers before, like the lobſter; and one of them is as thick as a man's thumb, and pinches moſt powerfully. It is, as I ſaid, without a ſhell to any part except its nippers. But what Nature has denied this animal it takes care to ſupply by art. It takes poſſeſſion of the deſerted ſhell of ſome other animal, and reſides in it, till by growing too large for its habitation, it is under a neceſſity of change. It is a native of the Weſt-India Iſlands; and like the former, it is ſeen every year deſcending from the mountains to the ſea-ſhore, to depoſit its ſpawn, and to provide itſelf with a new ſhell. This is a moſt buſtling time with it, having ſo many things to do; and, in fact, it appears very buſy. It is very probable that its firſt care is to provide for its offspring before it attends to its own wants; and it is thought, from the number of little ſhells which it is ſeen to examine, that it depoſits its ſpawn in them, which thus is placed in perfect ſecurity till the time of excluſion.

Yet it is not only till after many trials, but many combats alſo, that the ſoldier is completely accoutered; for there is often a conteſt between two of them for ſome favourite ſhell. They both endeavour to take poſſeſſion; they ſtrike with their claws; they bite each other, till the weakeſt is obliged to yield, by giving up the object of diſpute. Upon this the victor immediately takes poſſeſſion, and parades in his new conqueſt three or four times back and forward upon the ſtrand before his envious antagoniſt.

When this animal is taken, it ſends forth a feeble cry, endeavouring to ſeize the enemy with its nippers; which if it faſtens upon it will ſooner die than quit the graſp. The wound it makes is very painful, and not eaſily cured. For this reaſon, and as it is not much eſteemed for its fleſh, it is generally permitted to return to its old retreat to the mountains in ſafety. There it continues till the neceſſity of changing once more, and the deſire of producing an offspring, expoſe it to freſh dangers next year.

Tortoiſes.

Tortoiſes are uſually divided into thoſe that live upon land, and thoſe that ſubſiſt in the water; and uſe has made a diſtinction even in the name; the one being called tortoiſes, the other turtles. However, Seba has proved that all tortoiſes are amphibious; that the land tortoiſe will live in the water; and that the ſea turtle can be fed upon land. A land tortoiſe was brought to him that was caught in one of the canals of Amſterdam, which he kept for half a year in his houſe, where it lived very well in both elements. When in the water it remained with its head above the ſurface; when placed in the ſun, it ſeemed delighted with its beams, and continued immoveable while it felt their warmth. The difference, therefore, in theſe animals, ariſes rather from their habits than their conformation. Beſides, upon examination, there will be leſs variety found between them than between birds that live upon land, and thoſe that ſwim upon the water.

All tortoiſes, in their external form, reſemble each other greatly; their outward covering being compoſed of two great ſhells, the one laid upon the other, and only touching at the edges. However, upon a cloſe inſpection, we ſhall find that the upper ſhell is compoſed of no leſs than thirteen pieces. There are two holes at either edge of this vaulted body; one for a very ſmall head, ſhoulders and arms, to peep through, the other at the oppoſite edge, for the feet and the tail. The animal is never diſengaged from theſe ſhells; and they ſerve for its defence againſt every creature but man.

The land tortoiſe is generally found, from one to five feet long, from the end of the ſnout to the end of the tail; and from five inches to a foot and an half acroſs the back. It has a ſmall head, ſomewhat like that of a ſerpent: an eye without the upper lid; the under eye-lid ſerving to cover and keep that organ in ſafety. It has a ſtrong, ſcaly tail, like the lizard. Its head it can ſhew and hide at pleaſure, under the great penthouſe of its ſhell. There it can remain ſecure from all attacks. As the tortoiſe lives wholly upon vegetable food, it never ſeeks the encounter; yet, if any of the ſmaller animals attempt to evade its repoſe, they are ſure to ſuffer. The tortoiſe, impregnably defended, is furniſhed with ſuch a ſtrength of jaw, that, though armed only with bony plates inſtead of teeth, wherever it faſtens, it infallibly keeps its hold, until it has taken out the piece.

Though peaceable in itſelf, it is formed for war in another reſpect; for it ſeems almoſt endued with immortality. Nothing can kill it; the depriving it of one of its members, is but a ſlight injury; it will live, though deprived of its head. Tortoiſes are commonly known to live above eighty years; and there was one kept in the Archbiſhop of Canterbury's garden at Lambeth, that was above an hundred and twenty. It was at laſt killed by the ſeverity of the froſt, from which it had not ſufficiently defended itſelf in its winter retreat, which was a heap of ſand, at the bottom of the garden.

Though there is a circulation of blood in the tortoiſe, yet as the lungs are left out of the circulation, the animal not affected by it, can live without continuing to breathe. In this it reſembles the bat, the ſerpent, the mole, and the lizard. Like them too it takes up its dark reſidence for the winter; and in that ſeaſon, when its food is no longer in plenty, it luckily becomes inſenſible to the want. But it muſt not be ſuppoſed that, while it is thus at reſt, it totally diſcontinues to breathe. On the contrary, an animal of this kind, if put into a cloſe veſſel, without air, will ſoon be ſtifled; though not ſo readily as in a ſtate of vigour and activity.

The eggs of all the tortoiſe kind, like thoſe of birds, are furniſhed with a yolk and a white; but the ſhell is different, being ſomewhat like thoſe ſoft eggs that hens exclude before their time. This ſhell, however, is much thicker and ſtronger, and is a longer time in coming to maturity in the womb. The land tortoiſe lays but few in compariſon of the ſea turtle, that depoſits from an hundred and fifty to two hundred in a ſeaſon.

The amount of the land tortoiſe's eggs I have not been able to learn; but, from the ſcarceneſs of the animal, I am apt to think they cannot be very numerous. When it prepares to lay, the female ſcratches the earth a little, generally in a warm ſituation, where the beams of the ſun have their full effect. There depoſiting her eggs, and covering them with graſs and leaves, ſhe forſakes them, to be hatched by the heat of the ſeaſon. The young tortoiſes are generally excluded in about twenty-ſix days; but, as the heat of the weather aſſiſts, or its coldneſs retards incubation, ſometimes it happens that there is a difference of two or three days. The little animals no ſooner leave the egg, than they ſeek for their proviſion, entirely ſelf taught; and their ſhell, with which they are covered from the beginning, expands and grows larger with age. As it is compoſed of a variety of pieces, they are all capable of extenſion at their ſutures; and the ſhell admits increaſe in every direction.

It is common enough to take theſe animals into gardens, as they are thought to deſtroy inſects and ſnails in great abundance. We are even told, that, in hot countries, they are admitted into a domeſtic ſtate, as they are great deſtroyers of bugs.

The *Sea Tortoiſe*, or *Turtle*, as it is now called, is generally found larger than the former.

The Great Mediterranean Turtle is the largeſt of the turtle kind with which we are acquainted. It is found from five to eight feet long, and from ſix to nine hundred pounds weight; but, unluckily, its utility bears no proportion to its ſize, as it is unfit for food, and ſometimes poiſons thoſe who eat it. The ſhell alſo, which is a tough, ſtrong integument, like an hide, is uſeleſs. One of theſe animals was taken in the year 1729, at the mouth of the Loire, in nets that were deſigned for ſmaller fiſh. This turtle, which was of enormous ſtrength, by its own ſtruggles, involved itſelf in the nets, in ſuch a manner, as to be incapable of doing miſchief. Even thus ſhackled, it appeared terrible to the fiſhermen, who were at firſt diſpoſed to fly. Finding it impotent, however, they dragged it on ſhore, where it made a moſt horrible bellowing; and when they began to knock it on the head with their gaffs, it was heard at half a mile's diſtance. They were ſtill further intimidated by its nauſeous and peſtilential breath, which ſo powerfully affected them, that they were near fainting. This animal wanted but four inches of being eight feet long, and was above two feet over. Its ſhell was more like leather than the ſhell of a tortoiſe; and, unlike all other animals of this kind, it was furniſhed with teeth in each jaw, one rank behind another, like thoſe of a ſhark. Its feet alſo, different from the reſt of this kind, wanted claws; and the tail was quite diſengaged from the ſhell, and fifteen inches long, more like that of a quadruped than that of a tortoiſe.

Theſe are a formidable and uſeleſs kind, if compared to the turtle caught in the South Seas and the Indian Ocean, which are not only unlike each other in form, but furniſh man with very different advantages. They are uſually diſtinguiſhed by ſailors into four kinds; the Trunk Turtle, the Loggerhead, the Hawkſbill, and the Green Turtle.

The Hawkſbill Turtle is the leaſt of the four, and has a long and ſmall mouth, ſomewhat like the bill of an hawk. The fleſh of this alſo is very indifferent: but the ſhell ſerves for the moſt valuable purpoſes. This is the animal that ſupplies the tortoiſe ſhell, of which ſuch a variety of beautiful trinkets are made.

But of all animals of the tortoiſe kind, the green turtle is the moſt noted, and the moſt valuable, from the delicacy of its fleſh, and its nutritive qualities, together with the property of being eaſily digeſted. It is generally found to be about two hundred weight; though ſome are five hundred, and others not above fifty.

This animal ſeldom comes from the ſea to depoſit its eggs, and now and then to ſport in freſh-water. Its chief food is a ſubmarine plant, that covers the bottom of ſeveral parts of the ſea not far from the ſhore. There, when the weather is fair, the turtles feed in great numbers, like flocks of ſheep, ſeveral fathoms deep upon the verdant carpet below. After this, they generally float with their heads above water, unleſs they are alarmed by the approach of huntſmen, or birds of prey; in which caſe, they ſuddenly plunge to the bottom.

When the time for laying approaches, the female is ſeen, towards ſun-ſet to draw near the ſhore, and to look earneſtly about her, as if afraid of being diſcovered. When ſhe perceives any perſon on ſhore, ſhe ſeeks for another place; but if not, ſhe lands when it is dark, and goes to take a ſurvey of the ſand where ſhe deſigns to lay. Having marked the ſpot, ſhe returns without laying, for that night, to the ocean; but next night goes back to depoſit a part of her burthen. She begins by working and digging in the ſand with her fore feet, till ſhe has made a round hole, a foot broad, and a foot and a half deep, juſt at the place a little above where the water reaches higheſt. This done, ſhe lays eighty or ninety eggs at a time, each as big as a hen's egg, and as round as a ball. She continues laying about the ſpace of an hour; during which time, if a cart were driven over her, ſhe would not be induced to ſtir. The eggs are covered with a tough, white ſkin, like wetted parchment. When ſhe has done laying, ſhe covers the hole ſo dexterouſly, that it is not eaſy to find the place. She now returns to the ſea, and leaves her eggs to be hatched by the heat of the ſun. At the end of fifteen days, ſhe lays about the ſame number of eggs again; and at the end of another fifteen days, ſhe repeats the ſame; three times in all, uſing the ſame precautions every time for their ſafety.

In about twenty-four or twenty-five days after laying, the eggs are hatched by the heat of the ſun; and the young turtles, being about as big as quails, are ſeen to burſt from the ſand, as if earth-born, and to run directly to the ſea, with inſtinct only for their guide. But, to their great misfortune, it often happens that, their ſtrength being ſmall, the ſurges of the ſea, for a few days, beat them back upon the ſhore. Thus expoſed, they remain a prey to thouſands of birds that haunt the coaſts, which ſtooping down upon them carry off the greateſt part, and ſometimes the whole brood, before they have ſtrength ſufficient to withſtand the waves, or to dive to the bottom. There are ſeveral ways contrived for taking theſe animals. One is, to ſeize them when coupled together, at the breeding ſeaſon, when they are very eaſily approached, and as eaſily ſeen.

Another way of taking them is by the harpoon, either when they are playing on the ſurface of the water, or feeding on the bottom. When this inſtrument is ſkilfully darted, it ſticks faſt in the ſhell of the back. The wood then diſengages from the iron, and the line is long enough for the animal to take its range; for if the harpooner ſhould attempt at once to draw the animal into his boat till it is weakened by its own ſtruggling, it would probably get free.

There is yet another which, though ſeemingly awkward, is ſaid to be attended with very great ſucceſs. A good diver places himſelf at the head of the boat; and when the turtles are obſerved, which they ſometimes are in great numbers, aſleep on the ſurface, he immediately quits the veſſel at about fifty yards diſtance, and keeping ſtill under water, directs his paſſage to where the turtle was ſeen, and coming up beneath, ſeizes it by the tail. The animal awaking, ſtruggles to get free; and by this both are kept at the ſurface until the boat arrive to take them in.

The ſhell of Teſtaceous Fiſhes.

The ſhell of teſtaceous fiſhes may be conſidered as an habitation ſupplied by nature. It is an hard ſtony ſubſtance, made up ſomewhat in the manner of a wall. The animal derives part of the ſtony ſubſtance from outward objects, and the fluids of the animal itſelf furniſh the cement. Theſe united make that firm covering which ſhell fiſh generally reſide in till they die.

But, in order to give a more exact idea of the manner in which ſea-ſhells are formed, we muſt have recourſe to an animal that lives upon land, with the formation of whoſe ſhell we are beſt acquainted. This is the garden-ſnail, that carries its box upon its back.

To begin with the animal in its earlieſt ſtate, and to trace the progreſs of its ſhell from the time it firſt appears—The inſtant the young ſnail leaves the egg, it carries its ſhell or its box on its back. It does not leave the egg till it arrives at a certain growth, when its little habitation is ſufficiently hardened. This beginning of the ſhell is not much bigger than a pin's head, but grows very rapidly, having at firſt but two circumvolutions, for the reſt are added as the ſnail grows larger. In proportion as the animal increaſes in ſize, the circumvolutions of the ſhell increaſe alſo, until the number of thoſe volutes come to be five, which is never exceeded.

The part where the animal enlarges its ſhell is at the mouth, to which it adds in proportion as it finds itſelf ſtinted in its habitation below. Being about to enlarge its ſhell, it is ſeen with its little teeth biting and clearing away the ſcaly ſkin that grows at the edges. It is ſometimes ſeen to eat thoſe bits it thus takes off. At other times it only cleans away the margin when covered with films, and then adds another rim to its ſhell.

For the purpoſes of making the ſhell, which is natural to the animal, and without which it could not live three days, its whole body is furniſhed with glands, whoſe orifices emit a kind of ſlimy fluid, like ſmall ſpiders threads, which join together in one common cruſt or ſurface, and in time condenſe and acquire a ſtony hardneſs. It is this ſlimy humour that grows into a membrane and afterwards a ſtony ſkin. Nor can it have eſcaped any who have obſerved the track of a ſnail, that the gliſtening ſubſtance which it leaves on the floor or the wall is nothing but the materials with which the animal adds to its ſhell, or repairs it when broken.

With reſpect to the figure of ſhells, Ariſtotle has divided them into three kinds; and his method is the moſt conformable to nature. Theſe are, firſt, the univalve, or turbinated, which conſiſt of one piece, like the box of a ſnail. Secondly, the bivalve, conſiſting of two pieces, united by a hinge, like an oyſter; and thirdly, the multivalve, conſiſting of more than two pieces, as the acorn-ſhell, which has not leſs than twelve pieces in its compoſition. All theſe kinds are found in the ſea at different depths; and are valuable in proportion to their ſcarceneſs or beauty. All ſhells are formed of an animal or calcareous earth, that ferments with vinegar and other acids, and that burns into lime, but will not eaſily melt into glaſs.

Every ſhell, wherever it is found, is the ſpoil of ſome animal, that once found ſhelter therein. It matters not by what unaccountable means they may have wandered from the ſea; but they exhibit the moſt certain marks of their origin. From their numbers and ſituation, we are led to conjecture, that the ſea reached the places where they are found. From their varieties too we learn how little we know of all the ſea contains at preſent; as the earth furniſhes many kinds which our moſt exact and induſtrious ſhell-collectors have not been able to fiſh up from the deep.

To conceive the manner in which thoſe animals ſubſiſt that are hid from us at the bottom of the deep, we muſt again have recourſe to one of a ſimilar nature and formation, that we know, viz. the GARDEN-SNAIL. This creature is furniſhed with the organs of life in a manner almoſt as complete as the largeſt animal; with a tongue, brain, ſalival ducts, glands, nerves, ſtomach, and inteſtines; liver, heart and blood-veſſels. Beſides, it has a purple bag that furniſhes a red matter to different parts of the body together with ſtrong muſcles that hold it to the ſhell, and which are hardened, like tendons, at their inſertion.

But theſe it poſſeſſes in common with other animals. We muſt now ſee what it has peculiar to itſelf. The firſt ſtriking peculiarity is, that the animal has got its eyes on the points of its largeſt horns. When the ſnail is in motion, four horns are diſtinctly ſeen; but the two uppermoſt and longeſt deſerve particular conſideration, both on account of the various motions with which they are endued, and becauſe they have their eyes fixed at the extreme ends of them. This animal can direct its eyes by a regular motion out of the body; and ſometimes it hides them, by a very ſwift contraction into the belly. Under the ſmall horns is its mouth, which though it may appear too ſoft to be furniſhed with teeth, yet it has eight, with which it devours leaves, and other ſubſtances, ſeemingly harder than itſelf; and with which it ſometimes bites off pieces of its own ſhell.

Eighteen days after coition, the ſnails produce their eggs, and hide them in the earth with the greateſt ſolicitude and induſtry. Theſe eggs are in great numbers, round, white, and covered with a ſoft ſhell. They are alſo ſtuck to each other by an imperceptible ſlime, like a bunch of grapes, of about the ſize of a ſmall pea.

The ſnail is poſſeſſed not only of a power of retreating into its ſhell, but of mending it when broken. Sometimes theſe animals appear to be cruſhed to pieces; yet ſtill they ſet themſelves to work, and in a few days, mend all their numerous breaches. The ſame ſubſtance by which the ſhell is originally made, goes to repair the ruined habitation.

The ſnail ſubſiſts chiefly upon the leaves of plants and trees; but is very delicate in its choice. At the approach of winter, it buries itſelf in the earth, or retires to ſome hole, to continue in a torpid ſtate, during the ſeverity of the ſeaſon. It is ſometimes ſeen alone; but more frequently in company in its retreat; ſeveral being, for the moſt part, found together, apparently deprived of life and ſenſation. For the purpoſes of continuing in greater warmth and ſecurity, the ſnail forms a cover or lid to the mouth of its ſhell with its ſlime, which ſtops it up entirely, and thus protects it from every external danger. When the cover is formed too thick, the ſnail then breaks a little hole in it, which corrects the effect of that cloſeneſs, which proceeded from too much caution. In this manner, ſheltered in its hole from the weather, defended in its ſhell by a cover, it ſleeps during the winter; and, for ſix or ſeven months, continues without food or motion, until the genial call of ſpring breaks its ſlumber, and excites its activity.

The ſnail, having ſlept for ſo long a ſeaſon, awakes one of the firſt fine days of April; breaks open its cell, and ſallies forth in queſt of food. At firſt, almoſt any vegetable that is green, ſeems welcome; but the ſucculent plants of the garden are chiefly grateful; and the various kinds of pulſe are, at ſome ſeaſons, almoſt wholly deſtroyed by their numbers. A wet ſeaſon is generally favourable to their production; for this animal cannot bear very dry ſeaſons, or dry places, as they occaſion too great a conſumption of its ſlime, which robs it of its health and vigour.

Such are the moſt ſtriking particulars in the hiſtory of this animal; and this may ſerve as a general picture, to which the manners, and habitudes of the other tribes of this claſs may be compared and referred. 1. The ſea ſnail, of which naturaliſts have, from the apparent difference of their ſhells, mentioned fifteen kinds*. 2. The freſh water ſnail, of which there are eight kinds. 3. The land-ſnail, of which there are five. Theſe all bear a ſtrong reſemblance to the garden ſnail. All SNAILS THAT LIVE IN WATER, are peculiarly furniſhed with a contrivance by Nature, for riſing to the ſurface, or ſinking to the bottom. The manner in which this is performed, is by opening and ſhutting an orifice on the right ſide of the neck, which is furniſhed with muſcles for that purpoſe. The ſnail ſometimes gathers this aperture into an oblong tube, and ſtretches it above the ſurface of the water, in order to draw in or expel the air, as it finds occaſion. This may not only be ſeen, but heard by the noiſe which the ſnail makes in moving the water. By dilating this the ſnail riſes; by compreſſing it, it ſinks to the bottom.

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* D'Argenville's Conchyliologie.

But what renders theſe animals far more worthy of notice is, that they are viviparous, and bring forth their young not only alive, but with their ſhells upon their backs. This ſeems ſurprizing; yet it is true. The young attain to ſome degree of perfection in the womb of the parent: there they receive their ſtony coat; and from thence are excluded, with a complete apparatus for ſubſiſtence.

This ſtriking difference between the freſh-water and the garden ſnail, obtains alſo in ſome of the SEA KIND; among which there are ſome that are found viviparous, while others lay eggs in the uſual manner. But this is not the only difference between land and ſea ſnails. Many of the latter are deſtitute of horns; and none of them have above two. Indeed, if the horns of ſnails be furniſhed with eyes, and if, as ſome think, the length of the horn, like the tube of a teleſcope, aſſiſts viſion, theſe animals, which reſide chiefly in the gloomy bottom of the deep, can have no great occaſion for them. Eyes would be unneceſſary to creatures whoſe food is uſually concealed in the darkeſt places; and which poſſeſſed of very little motion, are obliged to grope for what they ſubſiſt on. To ſuch, I ſay, eyes would rather be an obſtruction than an advantage; and perhaps even thoſe that live upon land are without them!

There is a difference alſo in the poſition of the mouth, in the garden and the water ſnail. In the former, the mouth is placed croſs-wiſe, as in quadrupeds; furniſhed with jaw-bones, lips and teeth. In moſt of the ſea-ſnails, the mouth is placed longitudinally in the head; and, in ſome, obliquely, or on one ſide. Others, of the trochus kind, have no mouth whatſoever; but are furniſhed with a trunk, very long in ſome kinds, and ſhorter in others.

Of all ſea ſnails, that which is moſt frequently ſeen upon the ſurface, and whoſe ſhell is the thinneſt and moſt eaſily pierced, is the NAUTILUS. Whether, upon theſe occaſions, it is employed in eſcaping its numerous enemies at the bottom, or ſeeking for food, I will not venture to decide. The former conjecture, however, ſeems to be the moſt probable; for, upon opening its ſtomach, it is found to contain chiefly that food which it finds at the bottom.

Although there are ſeveral ſpecies of the nautilus, yet they may all be divided into two: the one with a white ſhell, as thin as paper, which it is often ſeen to quit, and again to reſume; the other with a thicker ſhell, ſometimes of a beautiful mother-of-pearl colour, and which quits its ſhell but rarely. This ſhell outwardly reſembles that of a large ſnail, but is generally ſix or eight inches acroſs. Within, it is divided into forty partitions, that communicate with each other by doors, if I may ſo call them, through which one could not thruſt a gooſe-quill. Almoſt the whole internal part of the ſhell is filled by the animal, the body of which, like its habitation, is divided into as many parts as there are chambers in its ſhell. All the parts of its body communicate with each other, through the doors or openings, by a long blood veſſel, which runs from the head to the tail. Hence the body of the animal, if taken out of the ſhell, may be compared to a number of ſoft bits of fleſh, of which there are forty, threaded upon a ſtring. From this extraordinary conformation, one would not be apt to ſuppoſe that the nautilus ſometimes quitted its ſhell, and returned to it again; yet nothing, though ſeemingly impoſſible, is more certain. The manner by which it contrives to diſengage every part of its body from ſo intricate an habitation; by which it makes a ſubſtance, to appearance as thick as one's wriſt, paſs through forty doors, each of which would ſcarcely admit a gooſe quill, is not yet diſcovered. The fact, however, is certain; for the animal is often found without its ſhell; and the ſhell is more frequently without the animal. It is moſt probable, that it has a power of making the ſubſtance of one ſection of its body remove up into that which is next; and thus, by multiplied removals, it extricates itſelf.

But this is not the peculiarity for which the nautilus has been moſt diſtinguiſhed. Its ſpreading the thin oar, and catching the flying gale, to uſe the poet's deſcription of it, has chiefly excited human curioſity. Theſe animals, particularly thoſe of the white, light kind, are chiefly found in the Mediterranean; and ſcarce any who have ſailed on that ſea, but muſt have ſeen them. When the ſea is calm, they are obſerved floating on the ſurface; ſome ſpreading their little ſail; ſome rowing with their feet, and others ſtill, floating upon their mouths, like a ſhip with the keel upward. If taken while thus employed, and examined, the extraordinary mechaniſm of their limbs for ſailing will appear more manifeſt. The nautilus is furniſhed with eight feet, which iſſue near the mouth, and may as properly be called barbs. Theſe are connected to each other by a thin ſkin, like that between the toes of a duck, but much thinner and more tranſparent. Of theſe eight feet thus connected, ſix are ſhort, and theſe are held up as ſails to catch the wind in ſailing. The two others are longer, and are kept in the water; ſerving, like paddles, to ſteer their courſe by. When the weather is quite calm, and the animal is purſued from below, it is then ſeen expanding only a part of its ſail, and rowing with the reſt. Whenever it is interrupted, or fears danger from above, it inſtantly furls the ſail, catches in all its oars, turns its ſhell mouth downward, and inſtantly ſinks to the bottom. Sometimes alſo it is ſeen pumping the water from its leaking hulk; and, when unfit for ſailing abandons its ſhell entirely. The forſaken hulk is ſeen floating along, till it daſhes, by a kind of ſhipwreck, upon the rocks or the ſhore.

It may ſeem whimſical to make a diſtinction between the animal perfections of turbinated and BIVALVED SHELL-FISH, or to place the ſnail above the oyſter. Yet this diſtinction ſtrongly and apparently obtains in nature; and we ſhall find the bivalved tribe of animals in every reſpect inferior to thoſe we have been deſcribing.

The Muſcle.

The muſcle, as is well known, whether belonging to freſh or ſalt-water, conſiſts of two equal ſhells, joined at the back by a ſtrong muſcular ligament that anſwers all the purpoſes of an hinge. By the elaſtic contraction of theſe, the animal can open its ſhells at pleaſure, about a quarter of an inch from each other. The fiſh is fixed to either ſhell by four tendons, by which it ſhuts them cloſe, and keeps its body firm from being cruſhed by any ſhock againſt the walls of its own habitation. It is furniſhed, like all other animals of this kind, with vital organs, though theſe are ſituated in a very extraordinary manner. It has a mouth furniſhed with two fleſhy lips. Its inteſtine begins at the bottom of the mouth, paſſes through the heart, which it penetrates, and ends in the anus; near which the lungs are placed, and through which it breathes, like thoſe of the ſnail kind. In this manner, therefore, its languid circulation is carried on*.

The multitude of theſe animals in ſome places is very great; but from their defenceleſs ſtate, the number of their deſtroyers is not inferior.

But notwithſtanding the number of this creatures animated enemies, it ſeems ſtill more fearful of the agitations of the element in which it reſides; for if daſhed againſt rocks, or thrown far on the beach, it is deſtroyed without a power of redreſs. In order to guard againſt theſe, which are to this animal the moſt common and the moſt fatal accidents, although it has a power of ſlow motion, which I ſhall preſently deſcribe, yet it endeavours to become ſtationary, and to attach itſelf to any fixed object it happens to be near. For this purpoſe it is furniſhed with a very ſingular capacity of binding itſelf by a number of threads to whatever object it approaches; and theſe Reumur ſuppoſed it ſpun artificially, as ſpiders do their webs which they faſten againſt a wall. Of this, however, later philoſophers have found very great reaſon to doubt. It is therefore ſuppoſed that theſe threads, which are uſually called the beard of the muſcle, are the natural growth of the animal's body, and by no means produced at pleaſure.

Its inſtrument of motion, by which it contrives to reach the object it wiſhes to bind itſelf to, is that muſcular ſubſtance reſembling a tongue, which is found long in proportion to the ſize of the muſcle. In ſome it is two inches long, in others not a third part of theſe dimenſions. This the animal has a power of thruſting out of its ſhell; and with this it is capable of making a ſlight furrow in the ſand at the bottom. By means of this furrow it can erect itſelf upon the edge of its ſhell. And thus continuing to make the furrow in proportion as it goes forward, it reaches out its tongue, that anſwers the purpoſe of an arm, and carries its ſhell edge-ways, as in a groove, until it reach the point intended. Where it determines to take up its reſidence it fixes the ends of its beard, which are glutinous, to the rock or the object, whatever it be; and thus, like a ſhip at anchor, braves all the agitations of the water. I have ſeen the beards a foot and an half long; and of this ſubſtance the natives of Palermo ſometimes make gloves and ſtockings.

Theſe ſhell-fiſh are found in lakes, in rivers, and in the ſea. Thoſe of the lake often grow to a very large ſize; but they ſeem a ſolitary animal. Thoſe of rivers are not ſo large, but are in greater abundance. The ſea muſcles, however, are the moſt numerous. Theſe are often bred artificially in ſalt water marſhes that are overflowed by the tide; the fiſhermen throwing them in at the proper ſeaſons. Undiſturbed too by the agitations of the ſea, and not preyed upon by their powerful enemies at the bottom, they caſt their eggs, which ſoon become perfect animals, and are generally found in cluſters of ſeveral dozen together. It requires a year for the peopling a muſcle-bed. If the number, therefore, conſiſt of forty thouſand, a tenth part may annually be left for the peopling the bed anew. Muſcles are taken from their beds from the month of July to October; and they are ſold at a very moderate price.

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* M. Mery. Ant. des Moules d'Etang.

The Oyſter.

From this animal the oyſter differs very little, except in the thickneſs of its ſhell, and its greater imbecility. The oyſter, like the muſcle, is formed with organs of life and reſpiration, with inteſtines which are very voluminous, a liver, lungs, and heart. Like the muſcle, it is ſelf-impregnated; and the ſhell, which the animal ſoon acquires, ſerves it for its future habitation. Like the muſcle, it opens its ſhell to receive the influx of water, and like that animal, it is ſtrongly attached to its ſhells both above and below.

The oyſter differs from the muſcle in being quite unable to change its ſituation. It has not the tongue, which ſupplies the defect of an arm in the muſcle, nevertheleſs it often attaches itſelf very firmly to any object it happens to approach. Nothing is ſo common in the rivers of the tropical climates as to ſee oyſters growing even amidſt the branches of the foreſt. Many trees which grow along the banks of the ſtream often bend their branches into the water, and particularly the mangrove, which delights in a moiſt ſituation. To theſe the oyſters, hang in cluſters, like apples upon the moſt fertile tree. In proportion too as the weight of the fiſh ſinks the plant into the water, where it ſtill continues growing, the number of oyſters increaſe, and hang upon the branches. This is effected by means of a glue proper to themſelves, which, when it cements, the joining is as hard as the ſhell, and as difficult to break.

Oyſters uſually caſt their ſpawn in May, which at firſt appears like drops of candle-greaſe, and ſticks to any hard ſubſtance it falls upon. Theſe are covered with a ſhell in two or three days; and in three years the animal is large enough to be brought to market. As they invariably remain in the places where they are laid, and as they grow without any other ſeeming food than the afflux of ſea-water, it is the cuſtom at Colcheſter, and other parts of the kingdom, where the tide ſettles in marſhes on land, to pick up great quantities of ſmall oyſters along the ſhore, which when firſt gathered ſeldom exceed the ſize of a ſixpence. Theſe are depoſited in beds where the tide comes in, and in two or three years they grow to a tolerable ſize. A mixture of freſh water entering into theſe repoſitories, is ſaid to improve their flavour, and to increaſe their growth and fatneſs.

The oyſters, however, which are prepared in this manner, are not ſo large as thoſe found ſticking to rocks at the bottom of the ſea, uſually called rock-oyſters. Theſe are ſometimes found as broad as a plate, and are admired by ſome as excellent food. But what is the ſize of theſe compared to the oyſters of the Eaſt Indies, ſome of whoſe ſhells I have ſeen two feet over! The oyſters found along the coaſt of Coromandel are capable of furniſhing a plentiful meal to eight or ten men; but it is agreed on all hands that they are no way equal to ours for delicacy or flavour.

Thus the muſcle and the oyſter appear to have but few diſtinctions, except in their ſhape, and the power of motion in the former. Other bivalved ſhell-fiſh, ſuch as the COCKLE, the SCALLOP, and the RAZOR-ſhell, have differences equally minute. The power of changing place, which ſome of them effect in a manner quite peculiar to themſelves, conſtitutes their greateſt difference. The *ſcallop* is particularly remarkable for its method of moving forward upon land, or ſwimming upon the ſurface of the water. When this animal finds itſelf left by the tide, it makes very remarkable efforts to regain the water, moving towards the ſea in a moſt ſingular manner. It firſt gapes with its ſhell as wide as it can, then it ſhuts them with a jerk, which makes it bound five or ſix inches from the ground. It then tumbles any how forward, and renews the operation until it has reached its journey's end. In the water it is capable of ſupporting itſelf upon the ſurface; and by opening and ſhutting its ſhell, it tumbles over and over, and makes its way pretty well.

The Pivot, or Razor-ſhell.

The pivot, or razor-ſhell, has a very different kind of motion. As the former moves laboriouſly and ſlowly forward, ſo the razor-ſhell has only a power of ſinking downward. The ſhells of this animal reſemble nothing ſo much as the haft of a razor; and by this form it is enabled to dive into the ſoft ſand at the bottom. All the motions of this little animal are confined to ſinking or riſing a foot downwards or upwards in the ſand, for it never leaves the ſpot where it was firſt planted. From time to time it is ſeen to riſe about half way out of its hole; but if diſturbed, it ſinks perpendicularly down again. Juſt over the place where the razor buries itſelf, there is a ſmall hole like a chimney, through which the animal breathes, or imbibes the ſea-water. Upon the ebbing of the tide, theſe holes are eaſily diſtinguiſhed by the fiſhermen who entice the razor up from the depth of its retreat, by ſprinkling a little ſea-ſalt upon the hole. This melting, no ſooner reaches the razor below, than it riſes inſtantly ſtraight upwards, and ſhews about half its length above the ſurface. This appearance, however, is inſtantaneous; and if the fiſher does not ſeize the opportunity, the razor deſcends immediately to its former depth. There it continus ſecure; no ſalt can allure it a ſecond time; but it remains unmoleſted, unleſs the fiſher will be at the trouble of digging it out ſometimes two feet below the ſurface.

Such are the minute differences between bivalved ſhell-fiſh; but in the great out-lines of their nature, they exactly reſemble each other. It is particularly in this claſs of ſhell fiſh that pearls are found in greateſt abundance. The pearl ſeems bred from no diſorder in the animal, but accidentally produced by the ſame matter that forms the ſhell. This ſubſtance, which is ſoft at firſt, quickly hardens; and thus, by ſucceſſive coats, layer over layer, the pearl acquires its demenſions. If cut through, it will be found to conſiſt of ſeveral coats, like an onion; and ſometimes a ſmall ſpeck is ſeen in the middle, upon which the coats were originally formed.

All oyſters, and moſt ſhell-fiſh, are found to contain pearls; but that which particularly obtains the name of the pearl oyſter, has a large ſtrong whitiſh ſhell, wrinkled and rough without, but ſmooth within, and of a ſilver colour. From theſe the mother-of pearl is taken, which is nothing more than the internal coats of the ſhell, reſembling the pearl in colour and conſiſtence. There are a great number of pearl fiſheries in America and Aſia. The chief of which is carried on in the Perſian Gulph.

The wretched people that are deſtined to fiſh for pearls, are either Negroes, or ſome of the pooreſt of the natives of Perſia. The divers are not only ſubject to the dangers of the deep, to tempeſts, to ſuffocation at the bottom, or being devoured by ſharks, but from their profeſſion univerſally labour under a ſpitting of blood, occaſioned by the preſſure of air upon their lungs in going down to the bottom. The moſt robuſt and healthy young men are choſen for this employment, but they ſeldom ſurvive it above five or ſix years. Their fibres become rigid; their eye-balls turn red; and they uſually die conſumptive.

It is amazing how very long they continue at the bottom. Some, as we are aſſured, have been three quarters of an hour under water without breathing; and to one unuſed to diving, ten minutes would ſuffocate the ſtrongeſt. They fiſh for pearls, or rather for the oyſters that contain them, in boats twenty eight feet long; and of theſe there are ſometimes three or four hundred at a time, with each ſeven or eight ſtones, which ſerve for anchors. From five to eight divers belong to each, that dive one after another. They are quite naked, except that they have a net hanging down from the neck to put their oyſters in, and gloves on their hands to defend them while they pick the oyſters from the holes in the rocks. Every diver is ſunk by means of a ſtone, weighing fifty pounds, tied to the rope by which he deſcends. He places his foot in a kind of ſtirrup, and laying hold of a rope with his left-hand, with his right he ſtops his noſe to keep in his breath. They are no ſooner come to the bottom, but they give the ſignal to thoſe who are in the boat to draw up the ſtone; which done, they go to work, filling their net as faſt as they can; and then giving another ſignal, the boats above pull up the net loaded with oyſters, and ſhortly after the diver himſelf, to take a freſh inſpiration. They dive to the depth of fifteen fathoms, but ſeldom deeper. They generally go every morning by break of day to this fatiguing employment, taking the land-wind to waft them out to ſea, and returning with the ſea breeze at night. The owners of the boats uſually hire the divers, and the reſt of the boats crew, as we do our labourers, at ſo much a day. All the oyſters are brought on ſhore, where they are laid in a great heap till the pearl fiſhery is over, which continues during the months of November and December. When opportunity ſerves, they examine every oyſter, and it ſometimes happens that the booty does not compenſate their trouble. Indeed, none can wiſh well to a commerce, which thus chains ſuch a number of fellow creatures to the bottom, to pluck up a mouldering pebble.

Multivalve Shell-Fiſh.

Multivalve ſhell fiſh may be conſidered as animals ſhut up in round boxes. Of theſe there are principally two kinds; ſuch as move, and ſuch as are ſtationary. The firſt are uſually known in our cabinets by the name of ſea-eggs: the others are often admired, from the cavities which they ſcoop out for their habitation in the hardeſt marble. The firſt are called, by naturaliſts, Echini, or Urchins. The latter are named Pholades, or File Fiſh.

The Sea-urchin.

Upon a ſlight view, the Sea urchin may be compared to the huſk of a cheſnut; being like it round, and having a number of bony prickles ſtanding out on every ſide. The mouth is placed downwards: the vent is above: the ſhell is a hollow vaſe, reſembling a ſcooped apple. This too is filled with a ſoft, muſcular ſubſtance, through which the inteſtines wind from the bottom to the top. The mouth, which is placed undermoſt, is large and red, furniſhed with five ſharp teeth, which are eaſily diſcerned. The jaws are ſtrengthened by five ſmall bones, in the centre of which is a ſmall fleſhy tongue. From this tongue the inteſtines make a winding of five ſpires, round the internal ſides of the ſhell, ending at top, where the excrements are voided. But the moſt extraordinary part of this animal's conformation, are its horns and its ſpines, that point from every part of the body, like the horns of a ſnail, and that ſerve at once as legs to move upon, as arms to feel with, and as inſtruments with which it can both ſeize upon its prey and defend itſelf. Between theſe horns it has alſo ſpines that are not endued with ſuch a ſhare of motion. The ſpines and the horns iſſue from every part of its body; the ſpines being hard and prickly; the horns being ſoft, longer than the ſpines, and never ſeen except in the water. They are put forward and withdrawn like the horns of a ſnail, and are hid at the baſis of the ſpines, and not only ſerve to procure food, but aſſiſt the animal in its motion. All this apparatus, however, is only ſeen when the animal is hunting its prey at the bottom of the water; for a few minutes after it is taken, all the horns are withdrawn into the body, and moſt of the ſpines drop off.

It is generally ſaid of inſects, that thoſe which have the greateſt number of legs, always move ſloweſt. This animal however, ſeems to be an exception to the rule; for though furniſhed with two thouſand ſpines, and twelve hundred horns, all ſerving for legs, and from their number ſeeming to impede each other's motion, yet it runs with ſome ſhare of ſwiftneſs at the bottom, and it is ſometimes pretty difficult to overtake it. It is often taken upon the ebb, by following it in ſhallow water, either in an ozier baſket, or ſimply with the hand. Both the ſpines and the horns aſſiſt its motion; and the animal is uſually ſeen running with the mouth downward.

Some kinds of this animal are as palatable as the lobſter; and its eggs, which are of a very deep red, are conſidered as a very great delicacy. But of the others the taſte is but indifferent; and in all places, except the Mediterranean, they are little ſought for, except as objects of curioſity.

Very different in motion, though not much different in ſhape from theſe are the ACORN Shell-fiſh, the THUMB-FOOTED Shell-fiſh, and the IMAGINARY BARNACLE. Theſe are fixed to one ſpot, and appear to vegetate from a ſtalk. Indeed, to an inattentive ſpectator, each actually ſeems to be a kind of fungus that grows in the deep, deſtitute of animal life as well as motion. But the inquirer will ſoon change his opinion, when he comes to obſerve this muſhroom-like figure more minutely. He will then ſee that the animal reſiding within the ſhell has not only life, but ſome degree of voraciouſneſs. They are ſeen adhering to every ſubſtance that is to be met with in the ocean; rocks, roots of trees, bottoms of ſhips, whales, lobſters, and even crabs; like bunches of grapes, clung to each other. It is amuſing enough to behold their operations*. They for ſome time remain motionleſs within their ſhell; but when the ſea is calm, they are ſeen opening the lid, and peeping about them. They then thruſt out their long neck, look round them for ſome time, and then abruptly retreat back into their box, ſhut their lid, and lurk in darkneſs and ſecurity. Some people eat them; but they are in no great repute at the tables of the luxurious.

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* Anderſon's Hiſtory of England.

Of all animals of the ſhelly tribe, the PHOLADES are the moſt wonderful. They are found in different places; ſometimes clothed in their proper ſhell, at the bottom of the water; ſometimes concealed in lumps of marly earth; and ſometimes lodged in their ſhell, in the hardeſt marble. In their proper ſhell they aſſume different figures; but, in general, they ſomewhat reſemble a muſcle, except that their ſhell is found actually compoſed of five or more pieces, the ſmaller valves ſerving to cloſe up the openings left by the irregular meeting of the two principal ſhells. But the circumſtance of their penetrating into rocks and reſiding in them is the moſt wonderful part of their hiſtory.

This animal, when diveſted of its ſhell, reſembles a roundiſh, ſoft pudding, with no inſtrument that ſeems in the leaſt fitted for boring into ſtones, or even penetrating the ſofteſt ſubſtance. It is furniſhed with two teeth indeed; but theſe are placed in ſuch a ſituation as to be incapable of touching the hollow ſurface of its ſtony dwelling. It has alſo two covers to its ſhell, that open and ſhut at either end; but theſe are totally unſerviceable to it as a miner. The inſtrument with which it performs all its operations, and buries itſelf in the hardeſt rocks, is only a broad fleſhy ſubſtance, ſomewhat like a tongue, that is ſeen to iſſue from the bottom of its ſhell. With this ſoft, yielding inſtrument, it perforates the moſt ſolid marbles; and having, while yet little and young, made its way, by a very narrow entrance into the ſubſtance of the ſtone, it then begins to grow and to enlarge its apartment.

When it has buried its body in a ſtone, it there continues for life, at its eaſe; the ſea-water that enters at the little aperture furniſhing it with enough of ſubſiſtence. When the animal has taken too great a quantity of water, it is ſeen to ſpurt it out of its hole with ſome violence. Upon this ſeemingly thin diet, it quickly grows larger, and ſoon finds itſelf under a neceſſity of enlarging its habitation and its ſhell. The motion of the pholas is extremely ſlow. Its progreſs keeps pace with the growth of its body; and, in proportion as it becomes larger, it makes its way farther into the rock. When it has got a certain way in, it then turns from its former direction, and hollows downward; till, at laſt, when its habitation is completed, the whole apartment reſembles the hole of a tobacco-pipe; the hole in the ſhank being that by which the animal entered.

But they are not ſupplied only with their rocky habitation: they have alſo a ſhell to protect them. This ſhell grows upon them in the body of the rock, and ſeems a very unneceſſary addition to their defence, which they have procured by art. Theſe ſhells take different forms, and are often compoſed of a different number of valves; ſometimes ſix; ſometimes but three. Sometimes too the ſhell reſembles a tube with holes at either end, one for the mouth, and the other for voiding the excrement.

Theſe animals are moſt numerous at Ancona in Italy; they are found along the ſhores of Normandy and Poitou, in France; and alſo upon ſome of the coaſts of Scotland. In general they are conſidered as a very great delicacy, at the tables of the luxurious.

C H A P. XXXIII.

OF AMPHIBIOUS ANIMALS—THE FROG—THE TOAD—VARIETIES—SURINAM TOAD—OF LIZARDS—THE CROCODILE AND ALLIGATOR—THE OPEN-BELLIED CROCODILE—SALAMANDER—THE CORDYLE, &C.—THE IGUANA—THE CAMELEON—THE DRAGON—THE CHALCIDIAN LIZARD.

IF we emerge from the deep, the firſt and moſt obvious claſs of amphibious animals that occur upon land are frogs and toads.

To deſcribe the form of animals ſo well known would be ſuperfluous; to mark thoſe differences that diſtinguiſh them from each other may be neceſſary. The frog moves by leaping: its colour is brighter, and of a more poliſhed ſurface: the toad is brown, rough, and duſty. The frog is light and active, and its belly comparatively ſmall. The toad, on the other hand, is ſlow, ſwollen, and incapable of eſcape. The frog, when taken, contracts itſelf ſo as to have a lump on its back: the toad's back is ſtraight and even. Their habitudes and manners exhibit a greater variety and require a ſeparate deſcription.

The external figure of the FROG is too well known to need a deſcription. Its power of taking large leaps is remarkably great, compared to the bulk of its body. It is the beſt ſwimmer too of all four-footed animals.

If we examine this animal internally, we ſhall find that it has very little brain for its ſize; a very wide ſwallow; a ſtomach ſeemingly ſmall, but capable of great diſtenſion. The heart in the frog, as in all other animals that are truly amphibious, has but one ventricle. Hence the blood can circulate without the aſſiſtance of the lungs, while it keeps under water. The lungs reſemble a number of ſmall bladders joined together, like the cells of a honey-comb. They are connected to the back by muſcles, and can be diſtended or exhauſted at the animal's pleaſure. Neither male nor female have any of the external inſtruments of generation; the anus ſerving for that purpoſe in both. Such are the moſt ſtriking peculiarities in the anatomy of a frog; and in theſe it agrees with the toad, the lizard, and the ſerpent.

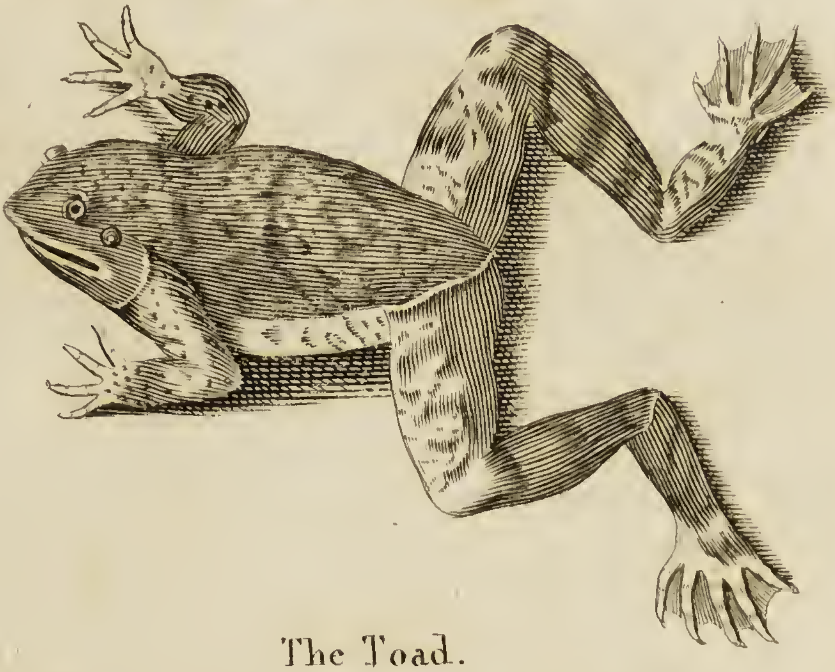
The female is impregnated neither by the mouth, as ſome philoſophers imagine, nor by the excreſcence at the thumbs, according to Linnæus, but by the inſpertion of the male ſeminal fluid upon the eggs as they proceed from the body.

A ſingle female produces from ſix to eleven hundred eggs at a time. Beſides ſhe, for the moſt part, throws them all out together by a ſingle effort; though ſometimes ſhe is an hour in performing this taſk.

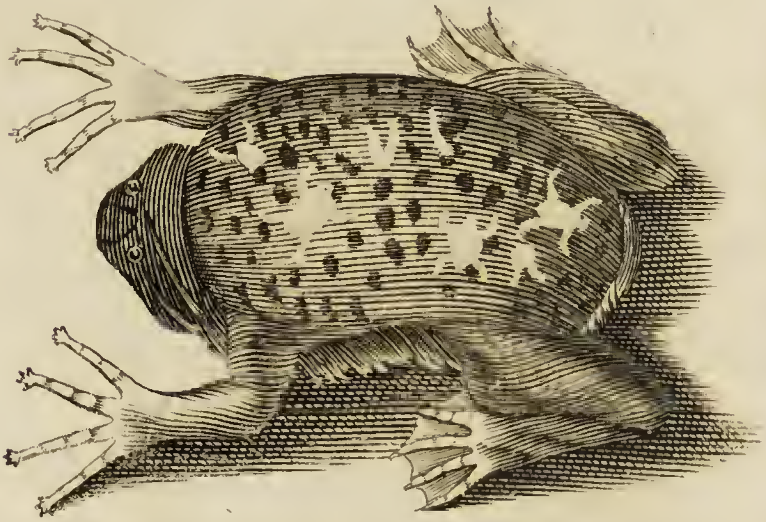
When the ſpawn is emitted and impregnated by the male, it drogs to the bottom. The eggs, which during the four firſt hours ſuffer no perceptible change, begin then to enlarge and grow lighter; by which means they mount to the ſurface of the water. On the twenty-firſt day the egg is ſeen to open a little on one ſide, and the beginning of a tail to peep out, which becomes more and more diſtinct every day. The thirty-ninth day the little animal begins to have motion. It moves at intervals its tail; and it is perceived that the liquor in which it is circumfuſed, ſerves it for nouriſhment. In two days more, ſome of theſe little creatures fall to the bottom, while others remain ſwimming

Plate 37.

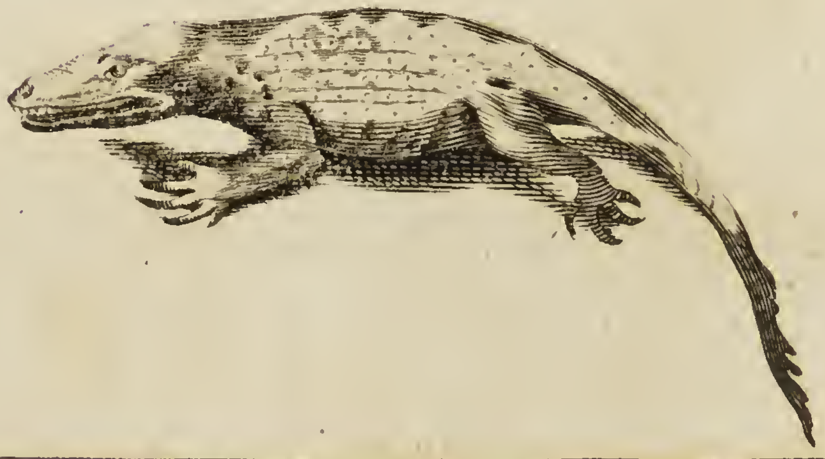
The Bull Frog.



The Toad.



The Crocodile.



J. Fraser sc.

in the fluid round them. In the mean time, their vivacity and motion is ſeen to increaſe. Thoſe which fall to the bottom remain there the whole day. Having lengthened themſelves however, a little, for hitherto they are doubled up, they mount at intervals to the mucus, which they had quitted, and feed upon it with great vivacity. The next day they acquire their tadpole form. In three days more they are perceived to have two little fringes, that ſerve as fins beneath the head, which in four days after aſſume a more perfect form. It is then alſo that they feed very greedily upon the pond-weed. When ninety-two days old, two ſmall feet begin to burgeon near the tail; and the head appears to be ſeparate from the body. In five days after this they refuſe all vegetable food: their mouth appears furniſhed with teeth; and their hinder legs are completely formed. In two days more the arms are completely produced. In this ſtate it continues for about ſix or eight hours; and then the tail dropping off by degrees, the animal appears in its moſt perfect form.

The frog, therefore, in leſs than a day, having changed its figure, is ſeen to change its appetites alſo. As ſoon as the animal acquires its perfect ſtate, from having fed upon vegetables it becomes carnivorous, and lives entirely upon worms and inſects. But as the water cannot ſupply theſe, it is obliged to quit its native element, and to ſeek for food upon land, where it lives by hunting worms and taking inſects by ſurpriſe.

The frog lives for the moſt part out of the water; but when the cold nights begin to ſet in, it returns to its native element, always chuſing ſtagnant waters, where it can lie concealed at the bottom. In this manner it continues torpid, or with but very little motion, all the winter. Like the reſt of the dormant race, it requires no food; and the circulation is ſlowly carried on without any aſſiſtance from the air.

The difference of ſexes, is not perceivable in theſe animals, until they have arrived at their fourth year; nor do they begin to propagate, till they have completed that period. By comparing their ſlow growth with their other habitudes, it would appear, that they live about twelve years; but having ſo many enemies, both by land and water, it is probable that few of them arrive at the end of their term.

Frogs live upon inſects of all kinds; but they never eat any, unleſs they have motion. They continue fixed and immoveable till their prey appears; and juſt when it comes ſufficiently near, they jump forward with great agility, dart out their tongues, and ſeize it with certainty. The tongue in this animal, as in the toad, lizard and ſerpent kinds, is extremely long, and formed in ſuch a manner that it ſwallows the point down its throat. A length of tongue is therefore drawn out, like a ſword from its ſcabbard, to aſſail its prey. This tongue is furniſhed with a glutinous ſubſtance; and whatever inſect it touches, infallibly adheres, and is thus held faſt till it is drawn into the mouth.

The croaking of frogs is well known; whence in ſome countries, they are diſtinguiſhed by the ludicrous title of Dutch Nightingales. The large water frogs have a note as loud as the bellowing of a bull; and, for this purpoſe, puff up their cheeks to a ſurpriſing ſize. Of all frogs, however, the male only croaks; the female is ſilent. Before wet weather, their voices are in full exertion. They then ſend forth their call inceſſantly, and welcome the approach of their favourite moiſture. No weather-glaſs was ever ſo true as a frog in foretelling an approaching change. This may probably ſerve to explain an opinion which ſome entertain, that there is a month in the year, called Paddock Moon, in which the frogs never croak. The whole ſeems to be no more than that, in the hot ſeaſon, when the moiſture is dried up, and conſequently when theſe animals neither enjoy the quantity of health nor food that at other times they are ſupplied with, they ſhew, by their ſilence, how much they are diſpleaſed with the weather.

Frogs adhere cloſely to the backs of their own ſpecies, and it has been found, that they will alſo adhere to the backs of fiſhes. Few that have ponds, but know that theſe animals will ſtick to the backs of carp, and fix their fingers in the corner of each eye. In this manner they are often caught together; the carp being blinded and waſted away.

The Toad.

If we regard the figure of the toad, there ſeems nothing in it that ſhould diſguſt more than that of the frog. Its form and proportions are nearly the ſame; and it chiefly differs in being of a blacker colour, and having a ſlow and heavy motion, which exhibits nothing of the agility of the frog. Such, however, is the force of habit, begun in early prejudice, that thoſe who conſider the one as an harmleſs, playful animal, turn from the other with horror and diſguſt. The frog is conſidered as a uſeful aſſiſtant, in ridding our grounds of vermin; the toad, as a ſecret enemy, that only waits an opportunity to infect us with its venom.

As the toad bears a general reſemblance in figure to the frog, ſo it reſembles that animal in its nature and appetites. When like the frog, theſe animals have undergone all the variations of their tadpole ſtate, they forſake the water, and are often ſeen, in a moiſt ſummer evening, crawling up, by myriads, from fenny places, into drier ſituations. There, having found out a retreat, or having dug themſelves one, they lead a patient ſolitary life, ſeldom venturing out, except when the moiſture of a ſummer's evening invites them abroad. At that time the graſs is filled with ſnails, and the pathways covered with worms, which are their principal food. They are alſo fond of inſects; and according to Linnæus, they ſometimes continue immoveable, with the mouth open, at the bottom of ſhrubs, where the butterflies, in ſome meaſure facinated, are ſeen to fly down their throats.

In a letter from Mr Arſcott, there are ſome curious particulars reſpecting this animal, which throws great light upon its hiſtory. "Concerning the toad," ſays he, "that lived ſo many years with us, and was ſo great a favourite, the greateſt curioſity was its becoming ſo remarkably tame. It had frequented ſome ſteps before our hall door ſome years before my acquaintance commenced with it, and had been admired by my father for its ſize (being the largeſt I ever met with) who conſtantly paid it a viſit every evening. I knew it myſelf above thirty years; and by conſtantly feeding it, brought it to be ſo tame, that it always came to the candle and looked up, as if expecting to be taken upon the table, where I always fed it with inſects of all ſorts. It was fondeſt of fleſh maggots, which I kept in bran. It would follow them, and would fix its eyes and remain motionleſs, for near a quarter of a minute, as if preparing for the ſtroke, which was an inſtantaneous throwing of its tongue at a great diſtance upon the inſect, which ſtuck to the tip by a glutinous matter. The motion is quicker than the eye can follow. I cannot ſay how long my father had been acquainted with the toad, before I knew it, but when I was firſt acquainted with it, he uſed to mention it as the old toad I have known ſo many years. I can anſwer for thirty-ſix years. This old toad made its appearance as ſoon as the warm weather came; and I always concluded it retired to ſome dry bank, to repoſe till ſpring. When we new laid the ſteps, I had two holes made in the third ſtep, in which I imagine it ſlept, as it came thence at its firſt appearance. It was ſeldom provoked. Neither that toad, nor the multitudes I have ſeen tormented with great cruelty, ever ſhewed the leaſt deſire of revenge, by ſpitting or emitting any juice from their pimples. Sometimes, upon taking it up, it would let out a great quantity of clear water, which as I have often ſeen it do the ſame upon the ſteps when quiet, was certainly its urine, and no more than a natural evacuation. Spiders, millepedes, and fleſh maggots, ſeem to be this animal's favourite food. I imagine if a bee was to be put before a toad, it would certainly eat it*. As bees, however, are ſeldom ſtirring at the ſame time that toads are, they rarely come in their way; for they do not appear after ſun-riſing, or before ſun-ſet. In the heat of the day they will come to the mouth of their hole, I believe for air. I once, from my parlour window, obſerved a large toad I had in the bank of a bowling-green, about twelve at noon, a very hot day, very buſy and active upon the graſs. So uncommon an appearance made me go out to ſee what it was. I then found an innumerable ſwarm of winged ants had dropped round his hole; which temptation was as irreſiſtible as a turtle would be to a luxurious alderman. In reſpect to its end, had it not been for a tame raven, I make no doubt but it would have been ſtill living. This bird, one day ſeeing it at the mouth of its hole, pulled it out, and, although I reſcued it, the raven injured it ſo that it died a twelve month after. Before that accident, it had all the appearance of perfect health." The toad, contrary to vulgar prejudice, is an harmleſs, defenceleſs creature, torpid and unvenomous, and ſeeking the darkeſt retreats, not from the malignity of its nature, but the multitude of its enemies.

Like all of the frog kind, the toad is torpid in winter. It chuſes then for a retreat either the hollow root of a tree, the cleft of a rock, or ſometimes the bottom of a pond, where it is found in a ſtate of ſeeming inſenſibility. As it is very long-lived, it is very difficult to be killed. Its ſkin is tough, and cannot be eaſily pierced; and, though covered with wounds, the animal continues to ſhew ſigns of life, and every part appears in motion. But what ſhall we ſay to its living for centuries lodged in the boſom of a rock, or caſed within the body of an oak tree, without the ſmalleſt acceſs on any ſide, either for nouriſhment or air, and yet taken out alive and perfect! Stories of this kind it would be as raſh to contradict as difficult to believe. We have the higheſt authorities bearing witneſs to their truth, and yet the whole analogy of nature ſeems to arraign them of falſehood. Bacon aſſerts that toads are found in this manner; Doctor Plot aſſerts the ſame; there is to this day a marble chimney-piece at Chatſworth with the print of the toad upon it, and a tradition of the manner in which it

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* Ræſel tried a frog; it ſwallowed the bee alive; its ſtomach was ſtung, and the animal vomited it up again.

was found. In the Memoirs of the Academy of Sciences there is an account of a toad found alive and healthy in the heart of a very thick elm, without the ſmalleſt entrance or egreſs*. In the year 1731 there was another found near Nants, in the heart of an old oak, without the ſmalleſt iſſue to its cell. The diſcoverer too was of opinion, from the ſize of the tree, that the animal could not have been confined leſs than eighty or a hundred years, without ſuſtenance and without air.

Of this animal there are ſeveral varieties; ſuch as the water and the land toad, which probably differ only in the ground-colour of their ſkin. In the firſt, it is more inclining to aſh-colour, with brown ſpots. In the other, the colour is brown, approaching to black. The water-toad is not ſo large as the other; but both equally breed in that element. The ſize of the toad with us is generally from two to four inches long; but, in the fenny countries of Europe, I have ſeen them much larger; and not leſs than a common crab. But this is nothing to what they are found in ſome of the tropical climates, where travellers often, for the firſt time, miſtake a toad for a tortoiſe. Their uſual ſize is from ſix to ſeven inches; but there are ſome ſtill larger, and as broad as a plate. Of theſe ſome are beautifully ſtreaked and coloured; ſome ſtudded over, as if with pearls; others briſtled with horns or ſpines. Some too have the head diſtinct from the body, while others have it ſo ſunk in, that the animal appears without a head. With us the opinion of its raining toads and frogs, has long been very juſtly exploded; but it ſtill is entertained in the tropical countries, and that not only by the ſavage natives, but likewiſe by the moſt refined ſettlers, who are apt enough to add the prejudices of other nations to their own.

It would be a tedious, as well as a uſeleſs taſk, to enter into all the minute diſcriminations of theſe animals, as found in different countries or places; but the PIPAL or the SURINAM TOAD, is too ſtrange a creature, not to require an exact deſcription.

This animal is in form more hideous than even the common toad. The body is flat and broad: the head is ſmall: the jaws, like thoſe of a mole, are extended, and evidently formed for rooting in the ground. The ſkin of the neck forms a ſort of wrinkled collar. The colour of the head is of a dark cheſnut, and the eyes are ſmall. The back, which is very broad, is of a lightiſh grey, and ſeems covered over with a number of ſmall eyes, which are round, and placed at nearly equal diſtances. Theſe eyes are very different from what they ſeem: they are the animal's eggs covered with their ſhells, and placed there for hatching. Theſe eggs are buried deep in the ſkin, and in the beginning of incubation but juſt appear; and are very viſible when the young animal is about to burſt from its confinement. They are of a reddiſh, ſhining yellow colour; and the ſpaces between them are full of ſmall warts not unlike pearls.

In this manner the pipal is ſeen travelling with her wondrous family on her back, in all the different ſtages of maturity. Some of the ſtrange progeny, not yet come to ſufficient perfection, appear quite torpid, and as yet without life in the egg. Others ſeem juſt beginning to riſe through the ſkin; here peeping forth from the ſhell; and there, having entirely forſaken their priſon. Some are ſporting at large upon the parent's

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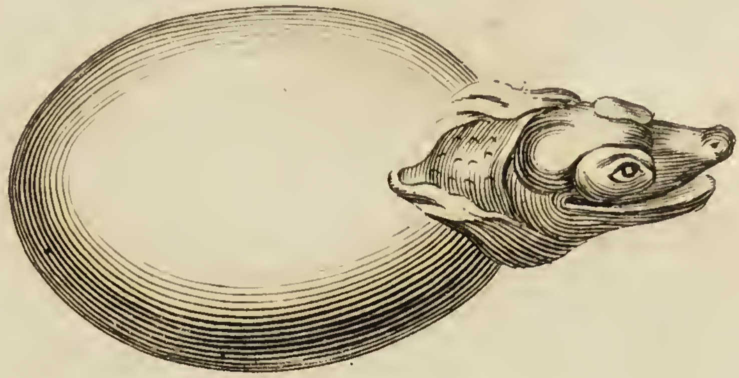
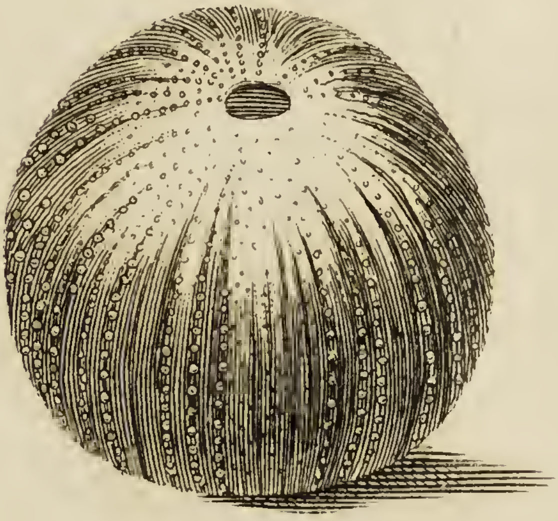
* Vide the Year 1719.

Plate 38.

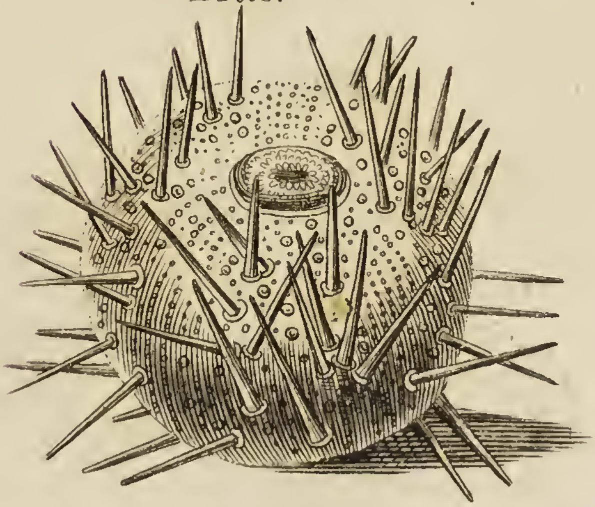
The Crocodiles Egg.



The Sea Urchin.



Ditto.



J. Fraser sc.

rent's back; and others deſcending to the ground, to try their own fortune below.

Of Lizards.

It is no eaſy matter to tell to what claſs in nature lizards are chiefly allied. They are unjuſtly raiſed to the rank of beaſts, as they bring forth eggs, diſpenſe with breathing, and are not covered with hair. They cannot be placed among fiſhes, as the majority of them live upon land. They are excluded from the ſerpent tribe, by their feet, upon which they run with ſome celerity; and from the inſects, by their ſeze; for though the Newt may be looked upon in this contemptible light, a crocodile would be a terrible inſect indeed.

As lizards thus differ from every other claſs of animals, they alſo differ widely from each other. With reſpect to ſize, no claſs of animals has its ranks ſo oppoſite.

The colour of theſe animals alſo is very various, as they are found of a hundred different hues, green, blue, red, cheſnut, yellow, ſpotted, ſtreaked, and marbled. Were colour alone capable of conſtituting beauty, the lizard would often pleaſe; but there is ſomething ſo forbidding in the animal's figure, that the brilliancy of its ſcales, or the variety of its ſpots, only tend to give an air of more exquiſite venom, or greater malignity. The figure of theſe animals is not leſs various. Sometimes they are ſwollen in the belly; ſometimes purſed up at the throat; ſometimes with a rough ſet of ſpines on the back, like the teeth of a ſaw; ſometimes with teeth, at other times with none. Sometimes they are venomous, at others harmleſs, and even philanthropic. They are ſometimes ſmooth and even. Sometimes they have a long, ſlender tail; and often a ſhort blunt one.

But their greateſt diſtinction ariſes from their manner of bringing forth their young. Some of them are viviparous: ſome again are oviparous; and ſome bring forth ſmall ſpawn, like fiſhes.

The Crocodile.

The Crocodile is an animal placed at a happy diſtance from the inhabitants of Europe, and formidable only in thoſe regions where men are ſcarce, and arts are but little known. In all the cultivated and populous parts of the world, the great animals are entirely baniſhed, or rarely ſeen. The appearance of ſuch raiſes at once a whole country up in arms to oppoſe their force; and their lives generally fall victims to their raſhneſs.

To look for this animal in all its natural terrors, grown to an enormous ſize, propagated in ſurpriſing numbers, and committing inceſſant devaſtations, we muſt go to the uninhabited regions of Africa and America, to thoſe immenſe rivers that roll through extenſive and deſolate kingdoms, where arts have never penetrated, where force only makes diſtinction, and where the moſt powerful animals exert their ſtrength with confidence and ſecurity.

Of this terrible animal there are two kinds; the Crocodile, properly ſo called, and the Cayman or Alligator. Travellers, however, have rather made the diſtinction than Nature; for in the general outline, and in the nature of theſe two animals they are entirely the ſame. The diſtinctions uſually made between the crocodile and alligator are theſe: the body of the crocodile is more ſlender than that of the alligator.

The ſnout of the former runs off tapering from the forehead, like that of a greyhound; while that of the latter is indented, like the noſe of a lap-dog. The crocodile has alſo a much wider ſwallow, and is of an aſh colour.

This animal grows to a great length, being ſometimes found 30 feet long, from the tip of the ſnout to the end of the tail; its moſt uſual length, however, is 18. One which was diſſected by the Jeſuits at Siam was 18 feet and an half French meaſure, in length; of which the tail was 5 feet and an half, and the head and neck above 2 feet and an half. It was 4 feet 9 inches in circumference, where thickeſt. The fore legs had the ſame parts and conformation as the arms of a man, both within and without. The hands, if they may be ſo called, had five fingers; the two laſt of which had no nails, and were of a conical figure. The hinder legs, including the thigh and paw, were 2 feet 2 inches long. The paws, from the joint to the extremity of the longeſt claws, were above 9 inches. They were divided alſo into four toes, of which three were armed with large claws, the longeſt of which was an inch and an half. Theſe toes were united by a membrane, like thoſe of a duck, but much thicker. The head was long, and had a little riſing at the top; but the reſt was flat, and eſpecially towards the extremity of the jaws. It was covered by a ſkin, which adhered firmly to the ſkull and to the jaws. The ſkull was rough and unequal in ſeveral places. The eye was very ſmall, in proportion to the reſt of the body. The jaws ſeemed to ſhut one within the other; and nothing can be more falſe than that the animal's under jaw is without motion. It moves, like the lower jaw in all other animals, while the upper is fixed to the ſkull, and abſolutely immoveable. The animal had twenty-ſeven cutting teeth in the upper jaw, and fifteen in the lower, with ſeveral void ſpaces between them. The diſtance of the two jaws, when opened as wide as they could be, was 15 inches and a half: this is a very wide yawn, and could eaſily enough take in the body of a man. From the ſhoulders to the extremity of the tail, the animal was covered with ſcales, of a ſquare form, diſpoſed like parallel girdles. The creature was covered not only with theſe, but all over with a coat of armour; which, however, was not proof againſt a muſquet-ball, contrary to what has been commonly aſſerted. It had no bladder; but the kidneys directed the urine ſo as to be diſcharged by the anus. There were ſixty two joints in the back bone, which, though very cloſely united, had ſufficient play to enable the animal to bend like a bow to the right and the left. What we hear therefore of eſcaping the creature by turning out of the right line, and of the animal not being able to wheel readily after its prey, ſeems to be fabulous.

Such is the figure and conformation of this formidable animal, that unpeoples countries, and renders the moſt navigable rivers deſart and dangerous. They are ſeen in ſome places, lying for whole hours, and even days, ſtretched in the ſun, and motionleſs. Thus one unaccuſtomed to them, might miſtake them for trunks of trees, covered with a rough and dry bark; but the miſtake would ſoon be fatal, if not prevented: for the torpid animal, at the near approach of any living thing, darts upon it with inſtant ſwiftneſs, and at once drags it down to the bottom. In the times of an inundation, they ſometimes enter the cottages of the natives, where the dreadful viſitant ſeizes the firſt animal it meets with. There have been ſeveral examples of their taking a man out of a canoe in ſpite of his companions.

The ſtrength of every part of the crocodile is very great; and its arms are irreſiſtible. Moſt naturaliſts have remarked, from the ſhortneſs of its legs, the amazing ſtrength of the tortoiſe. But what is the ſtrength of ſuch an animal, compared to that of the crocodile, whoſe legs are very ſhort, and whoſe ſize is ſo far ſuperior? Its principal inſtrument of deſtruction is the tail: with a ſingle blow of this it has often overturned a canoe, and ſeized upon the poor ſavage, its conductor.

Though not ſo powerful, yet it is very terrible even upon land. The crocodile ſeldom, except when preſſed by hunger, or with a view of depoſiting its eggs, leaves the water. Its uſual method is to float along upon the ſurface, and to ſeize whatever animals come within its reach; but when this method fails, it then goes cloſer to the bank. Diſappointed of its fiſhy prey, it there waits covered up among the ſedges, in patient expectation of the dog, the bull, the tiger, man himſelf, or, in ſhort, any other land animal. Nothing is to be ſeen of the inſidious deſtroyer as the animal approaches; nor is its retreat diſcovered till it be too late for ſafety. It ſeizes the victim with a ſpring, and that too much faſter than ſo unwieldy an animal could be thought capable of. Having then ſecured the creature with both teeth and claws, it drags it into the water, inſtantly ſinks with it to the bottom, and in this manner quickly drowns it.

Sometimes it happens that the creature the crocodile has thus ſurpriſed eſcapes from its graſp wounded, and makes off from the riverſide. In ſuch a caſe, the tyrant purſues with all its force, and often ſeizes it a ſecond time; for, though ſeemingly heavy, the crocodile runs very faſt. In this manner it is ſometimes ſeen above half a mile from the bank, in purſuit of a wounded animal, and then dragging it back to the river-ſide, where it feaſts in ſecurity.

It often happens, in its depredations along the bank, that the crocodile ſeizes on a creature as formidable as itſelf, and meets with a moſt deſperate reſiſtance. We are told of frequent combats between the crocodile and the tiger. All creatures of the tiger kind are continually oppreſſed by a parching thirſt, that keeps them in the vicinity of great rivers, whither they deſcend to drink very frequently. It is upon theſe occaſions that they are ſeized by the crocodile; and they die not unrevenged. The inſtant they are ſeized upon, they turn with the greateſt agility, and force their claws into the crocodile's eyes, while he plunges with his fierce antagoniſt into the river. There they continue to ſtruggle, till the tiger is drowned.

In this manner the crocodile ſeizes and deſtroys all animals, and is equally dreaded by all. There is no animal, but man alone, that can combat it with ſucceſs. We are aſſured by Labat, that a Negroe, with no other weapon than a knife in his hand, and his left arm wrapped round with a cow's hide, ventures boldly to attack this animal in its own element. As ſoon as he approaches the crocodile, he preſents his left arm, which the animal ſwallows moſt greedily. But the arm ſticking in its throat, the Negroe has time to give it ſeveral ſtabs under the throat; and the water alſo getting in at the mouth, which is held involuntarily open, the crocodile is ſoon bloated up as big as a tun, and expires.

Whatever be the truth of theſe accounts, it is certain, that crocodiles are taken by the Siameſe in great abundance. The manner of taking it, is, by throwing three or four ſtrong nets acroſs a river, at proper diſtances from each other; ſo that, if the animal breaks through the firſt, it may be caught by one of the reſt. When it is firſt taken, it employs its tail with great force; but, after many unſucceſsful ſtruggles, it is at laſt exhauſted. Then the natives approach their priſoner in boats, and pierce him with their weapons in the moſt tender parts, till he is weakened with the loſs of blood. When he is become motionleſs, they firſt tye up his mouth; and with the ſame cord, they faſten his head to his tail; which laſt they bend back like a bow. They are not, however, yet perfectly ſecure from his fury; but, for their greater ſafety they tie both his fore and hind feet to the top of his back.

The crocodile, when in this condition, ſerves, to divert the great men of the Eaſt. It is often managed like an horſe: a curb is put into its mouth, and the rider directs it as he thinks proper. Though awkwardly formed, it does not fail to proceed with ſome degree of ſwiftneſs, and is thought to move as faſt as ſome of the moſt unwieldy of our own animals, the hog, or the cow.

Along the rivers of Africa, this animal is ſometimes taken in the ſame manner as the ſhark. Several Europeans go together in a large boat, and throw out a piece of beef upon a hook and ſtrong fortified line, which the crocodile ſeizing and ſwallowing, is drawn along, floundering and ſtruggling until its ſtrength is quite exhauſted. Then it is pierced in the belly, which is its tendereſt part; and, after numberleſs wounds, it is drawn aſhore. In this part of the world alſo, as well as at Siam, the crocodile makes an object of ſavage pomp, near the palace of their monarchs. Philips informs us, that at Sabi, on the Slave Coaſt, there are two pools of water near the Royal Palace, where crocodiles are bred, as we breed carp in our ponds in Europe.

There is a very powerful ſmell of muſk about all theſe animals. Travellers are not agreed in what part of the body theſe muſk-bags are contained; but the moſt probable opinion is, that this ſubſtance is amaſſed in glands under the legs and arms. The crocodile's fleſh is, at beſt, very bad, and tough; but, unleſs the muſk-bags be ſeparated, it is intolerable. The Negroes themſelves cannot well digeſt the fleſh; but a crocodile's egg is to them the moſt delicate morſel in the world.

All crocodiles breed near freſh waters; and for this purpoſe, the female, when ſhe comes to lay, chuſes a place by the ſide of a river, or ſome freſh-water lake, to depoſit her brood in. She always pitches upon an extenſive ſandy ſhore. Their ſhe depoſits from eighty to an hundred eggs, of the ſize of a tennis-ball, and of the ſame figure, covered with a tough, white ſkin, like parchment. She takes above an hour to perform this taſk; and then, covering up the place ſo artfully that it can ſcarcely be perceived, ſhe returns next day. Upon her return, with the ſame precaution as before, ſhe lays about the ſame number of eggs; and the day following alſo a like number. Thus, having depoſited her whole quantity, and having covered them cloſe up in the ſand, they are ſoon vivified by the heat of the ſun; and, at the end of thirty days, the young ones begin to break open the ſhell. At this time, the female is inſtinctively taught that her young ones ſtand in need of relief; and ſhe goes up on land, to ſcratch away the ſand, and ſet them free. Her brood quickly avail themſelves of their liberty: a part run unguided to the water: another part aſcend the back of the female, and are carried thither in greater ſafety. But the moment they arrive at the water, all natural connection is at an end. The whole brood ſcatters into different parts at the bottom: by far the greateſt number are deſtroyed: and the reſt find ſafety in their agility or minuteneſs.

The Open-bellied Crocodile is furniſhed with a falſe belly, like the opoſſum, where the young creep out and in, as their dangers or neceſſities require. It is probable that this Open bellied Crocodile is viviparous, and foſters her young that are prematurely excluded, in this ſecond womb, until they arrive at proper maturity.

The Salamander.

The ancients have deſcribed a lizard that is bred from heat, that lives in the flames, and feeds upon fire, as its proper nouriſhment. It will be needleſs to ſay that there is no ſuch animal exiſting; and that, above all others the modern Salamander has the leaſt affinity to ſuch an abode.

There have not been leſs than ſeven ſorts of this animal deſcribed by Seba. And to have ſome idea of the peculiarity of their figure, we may ſuppoſe the tail of a lizard applied to the body of a frog.

But it is not in figure that this animal chiefly differs from the reſt of the lizard tribe. In conformation it is unlike, as the ſalamander is produced alive from the body of its parent, and is completely formed the moment of its excluſion. It differs from them alſo in its being thought venomous, although no experiments that have been hitherto made, ſeem to confirm the truth of the report.

The ſalamander beſt known in Europe, is from eight to eleven inches long, uſually black, ſpotted with yellow; and when taken in the hand, feels cold to a great degree. There are ſeveral kinds; and our Black Water Newt is reckoned among the number. The idle report of its being inconſumable by fire, has made many of theſe poor animals to be burnt; but ſcarce any philoſopher could think it neceſſary to make the experiment. When thrown into the fire, the animal is ſeen to burſt with the heat of its ſituation, and to eject its fluids. We are gravely told in the Philoſophical Tranſactions, that this is a method the animal takes to extinguiſh the flames.

The whole of the lizard kind are ſo tenacious of life, that they will live ſeveral hours after the loſs of the head. They alſo ſuſtain the want of food in a ſurpriſing manner. One of them, brought from the Indies, lived nine months, without any other food than what it received from licking a piece of earth on which it was brought over*. Another was kept by Seba in an empty vial for ſix months, without any nouriſhment; and Redi takes notice of a large one, brought from Africa, that lived for eight months without any nouriſhment whatever. Indeed, as many of this kind, both ſalamanders and lizards, are torpid or nearly ſo during the winter, the loſs of their appetite for ſo long a time is the leſs ſurpriſing.

Directly deſcending from the crocodile, in this claſs, we find the Cordyle, the Tockay, and the Tejuguacu, all growing leſs in order. Theſe fill up the chaſm to be found between the crocodile and the African Iguana.

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* Phil. Tranſ. ann. 1661. N. 21. art. 7.

The Iguana.

The iguana which deſerves our notice, is about three feet long, and the body is about as thick as one's thigh. The ſkin is covered with ſmall ſcales, like thoſe of a ſerpent; and the back is furniſhed with a row of prickles, that ſtand up, like the teeth of a ſaw. Both the jaws are full of very ſharp teeth; and the bite is dangerous, though not venomous. The male has a ſkin hanging under his throat, which reaches down to his breaſt; and, when out of humour, he puffs it up like a bladder. He is one third larger and ſtronger than the female, though the ſtrength of either avails them little towards their defence. The males are aſh-coloured, and the females are green.

The fleſh of theſe may be conſidered as the greateſt delicacy of Africa and America; and the ſportſmen of thoſe climates go out to hunt the iguana, as we do in purſuit of the pheaſant or the hare. In the beginning of the ſeaſon, when the great floods of the tropical climates are paſt, and vegetation ſtarts into univerſal verdure, the ſportſmen are ſeen, with a nooſe and a ſtick, wandering along the ſides of the rivers, to take the iguana. This animal, though it appears to be formed for combat, is the moſt harmleſs creature of the foreſt. It lives among the trees, or ſports in the water, without ever offering to offend. There, having fed upon the flowers of the mahot, and the leaves of the mapou, that grow along the banks of the ſtream, it repoſes upon the branches of the trees that hang over the water. Upon land, the animal is ſwift of foot; but, when once in poſſeſſion of a tree, it ſeems conſcious of the ſecurity of its ſituation, and never offers to ſtir. There the ſportſman eaſily finds it, and as eaſily faſtens his nooſe round its neck. If the head be placed in ſuch a manner that the nooſe cannot readily be faſtened, by hitting the animal a blow on the noſe with the ſtick, it lifts its head, and offers it in ſome meaſure to the nooſe. In this manner, and alſo by the tail, the iguana is dragged from the trees, and killed by repeated blows on the head.

The Cameleon.

The cameleon is a very different animal; and as the iguana ſatisfies the appetites of the epicure, the cameleon on the other hand, is rather the feaſt of the philoſopher. Like the crocodile, this little animal proceeds from an egg; and it alſo nearly reſembles that formidable creature in form.

The head of a large cameleon is almoſt two inches long; and thence to the beginning of the tail, four and a half. The tail is five inches long, and the feet two and a half. The thickneſs of the body is different at different times: ſometimes, from the back to the belly, it is two inches, and ſometimes but one; for it can blow itſelf up, and contract itſelf at pleaſure. This ſwelling and contraction is not only of the back and belly, but of the legs and tail.

The cameleon has a power of driving the air it breathes over every part of the body. Notwithſtanding this, it only gets between the ſkin and the muſcles; for the muſcles themſelves are never ſwollen. The ſkin is very cold to the touch; and though the animal ſeems ſo lean, there is no one can feel the beating of the heart. The ſurface of the ſkin is unequal, and has a grain not unlike ſhagreen, but very ſoft, becauſe each eminence is as ſmooth as if it were poliſhed. The colour of all theſe eminences, when the cameleon is at reſt in a ſhady place, is of a blueiſh grey; and the ſpace between is of a pale red and yellow.

But when the animal is removed into the ſun, then comes the wonderful part of its hiſtory. At firſt, it appears to ſuffer no change of colour, its greyiſh ſpots ſtill continuing the ſame. The whole ſurface, however, ſoon ſeems to imbibe the rays of light; and the ſimple colouring of the body changes into a variety of beautiful hues. Wherever light comes upon the body, it is of a tawny brown; but that part of the ſkin on which the ſun does not ſhine, changes into ſeveral brighter colours, pale yellow, or vivid crimſon; which form ſpots of the ſize of half one's finger. Some of theſe deſcend from the ſpine half way down the back; and others appear on the ſides, arms, and tail. Sometimes the animal becomes all over ſpotted with brown ſpots, of a greeniſh caſt. When it is wrapped up in a white linen cloth for two or three minutes, the natural colour becomes much lighter; but not perfectly white, as ſome authors have pretended. It muſt not however, hence be concluded, that the cameleon aſſumes the colour of the objects which it approaches. This is entirely an error, and probably has taken its riſe from the continual changes it appears to undergo.

When the cameleon changes place, and attempts to deſcend from an eminence, it moves with the utmoſt precaution, advancing one leg very deliberately before the other, ſtill ſecuring itſelf by holding whatever it can graſp by the tail. It ſeldom opens the mouth, except for freſh air; and when that is ſupplied, it diſcovers its ſatisfaction by its motions, and the frequent changes of its colour. The tongue is ſometimes darted out after its prey, which is flies; and this is as long as the whole body. The eyes are remarkably little, though they ſtand out of the head; but the moſt extraordinary part of their conformation is, that the animal often moves one eye, when the other is entirely at reſt. Even ſometimes one eye will ſeem to look directly forward, while the other looks backward; and one will look upwards, while the other looks downwards.

The Dragon.

To this claſs of lizards we may refer the dragon, a moſt terrible animal, if we were to credit the invention of fable and ſuperſtition. Happily, however, ſuch ravagers are no where found at preſent; and the whole race of dragons is dwindled down to the Flying Lizard, a little harmleſs creature, that only preys upon inſects, and even ſeems to embelliſh the foreſt with its beauty.

The Chalcidian Lizard.

The laſt animal of the lizard kind that I ſhall mention, is the Chalcidian Lizard, of Aldrovandus, very improperly called the Seps, by modern hiſtorians. This animal ſeems to make the ſhade that ſeparates the lizard from the ſerpent race. It has four legs, like the lizard; but ſo ſhort, as to be utterly unſerviceable in walking. It has a long ſlender body, like the ſerpent; and it is alſo ſaid to have the ſerpent's malignity. Theſe animals are found above three feet long, and thick in proportion, with a large head, and pointed ſnout. The whole body is covered with ſcales; and the belly is white, mixed with blue. It has four crooked teeth; as alſo a pointed tail, which, however, can inflict no wound. It is viviparous. Upon the whole, it appears to bear a ſtrong affinity to the viper; and, like that animal, its bite may be dangerous.

CHAP. XXXIV.

OF SERPENTS—OF THE VENOMOUS KIND—THE VIPER—THE RATTLE-SNAKE—THE WHIP-SNAKE—THE ASP—THE JACULUS—THE HÆMORRHOIS—THE SEPS—THE CORAL SNAKE—THE COBRA-CAPELLA—SERPENTS WITHOUT VENOM—THE BLACK SNAKE—THE BLIND WORM—THE AMPHISBÆNA—THE ESCULAPIAN—THE BOYUNA—THE SURINAM SERPENT—THE PRINCE OF SERPENTS—THE GERENDA—JIBOYA—THE BOIGUACU—THE DEPONA.

Of Serpents.

IN none of the countries of Europe is the ſerpent tribe ſufficiently numerous to be truly terrible. The various malignity alſo that has been aſcribed to European ſerpents of old, is now utterly unknown. There are not above three or four kinds that are dangerous, and their poiſon operates in all in the ſame manner. A burning pain in the part, eaſily removeable by timely applications, is the worſt effect that we experience from the bite of the moſt venomous ſerpents of Europe.

Though, however, Europe be happily delivered from theſe reptiles, in the warm countries that lie within the tropic, as well as in the cold regions of the north, where the inhabitants are but few, the ſerpents abound. All along the ſwampy banks of the river Niger or Oroonoko, where the ſun is hot, the foreſts thick, and the men are but few, the ſerpents cling among the branches of the trees in infinite numbers, and carry on an unceaſing war, againſt all other animals in their vicinity. Travellers have aſſured us that they have often ſeen large ſnakes twining round the trunk of a tall tree, encompaſſing it like a wreath, and thus riſing and deſcending at pleaſure. In theſe countries, therefore, the ſerpent is too formidable to become an object of curioſity, as it excites much more violent ſenſations.

We are not, therefore, to reject as wholly fabulous, the accounts left us by the ancients of the terrible devaſtations committed by a ſingle ſerpent. It is probable, in early times, when the arts were little known, and mankind were but thinly ſcattered over the earth, that ſerpents, continuing undiſturbed poſſeſſors of the foreſt, grew to an amazing ſize; and every other tribe of animals fell before them. We have many hiſtories of antiquity, which preſent us with ſuch a picture; and which exhibit a whole nation ſinking under the ravages of a ſingle ſerpent. We are told, that while Regulus led his army along the banks of the Bagrada, in Africa, an enormous ſerpent diſputed his paſſage acroſs that river. We are aſſured by Pliny, who ſays that he himſelf ſaw the ſkin, that it was an hundred and twenty feet long, and that it had deſtroyed many of the army. At laſt, however, the battering engines were brought out againſt it; and theſe aſſailing it at a diſtance, overpowered it.

With reſpect to their conformation, all ſerpents have a very wide mouth, in proportion to the ſize of the head; and what is very extraordinary, they can gape and ſwallow the head of another animal which is three times as big as their own. To explain this, it muſt be obſerved, that the jaws of this animal do not open as ours, in the manner of a pair of hinges, where bones are applied to bones, and play upon one another. The ſerpent's jaws on the contrary, are held together at the roots by a ſtretching muſcular ſkin ; by which means they open as widely as the animal chuſes to ſtretch them, and admit a prey much thicker than the ſnake's own body. The throat, like ſtretching leather, dilates to admit the morſel : the ſtomach too receives it in part ; and the reſt remains in the gullet, till putrefaction and the juices of the ſerpent's body unite to diſſolve it.

With regard to the teeth, I ſhall ſpeak more of them when I come to treat of the viper's poiſon The tongue in all theſe animals is long and forky. It is compoſed of two long fleſhy ſubſtances, which terminate in ſharp points, and are very pliable. Some of the viper kind have tongues a fifth part of the length of their bodies. They continually dart out, but they are entirely harmleſs, and only terrify thoſe who are ignorant of the real ſituation of their poiſon.

The ſkin is compoſed of a number of ſcales, united to each other by a tranſparent membrane, which grows harder as it grows older, until the animal changes it, which is generally done twice a year. This cover then burſts near the head, and the ſerpent creeps from it, by an undulatory motion, in a new ſkin, far more vivid than the former. As the edges of the foremoſt ſcales lie over the ends of their following ſcales, ſo thoſe edges, when the ſcales are erected, which the animal has a power of doing in a ſmall degree, catch in the ground, like the nails in the wheel of a chariot, and ſo promote and facilitate the animal's progreſſive motion. They erect theſe ſcales by a multitude of diſtinct muſcles, with which each is ſupplied.

This tribe of animals, like that of fiſhes, ſeems to have no bounds ſet to their growth. Their bones are in a great meaſure cartilaginous, and they are conſequently capable of great extenſion. The older, therefore a ſerpent becomes, the larger it grows ; and as they ſeem to live to a great age, they arrive at an enormous ſize.

Legnat aſſures us, that he ſaw a ſerpent in Java, that was fifty feet long; and Carli mentions their growing to above forty feet. Mr Wentworth, aſſures me, that, in the Brebices in America, they grow to an enormous length. He one day ſent out a ſoldier, with an Indian, to kill wild fowl for the table ; and they accordingly went ſome miles from the fort. In purſuing their game, the Indian, who generally marched before, beginning to tire, went to reſt himſelf upon the fallen trunk of a tree, as he ſuppoſed ; but when he was juſt about to ſit down, the enormous monſter began to move, and the poor ſavage perceiving that he had approached a Lyboya the greateſt of all the ſerpent kind, dropped down in an agony. The ſoldier who perceived at ſome diſtance what had happened, levelled at the ſerpent's head, and, by a lucky aim, ſhot it dead. Notwithſtanding this, he continued his fire, until he was aſſured that the animal was killed; and then going up to reſcue his companion, who was fallen motionleſs by its ſide, he, to his aſtoniſhment, found him dead likewiſe, being killed by the fright. Upon his return to the fort, and telling what had happened, Mr Wentworth ordered the animal to be brought up, when it was meaſured, and found to be thirty-ſix feet long.

In the Eaſt Indies they grow alſo to an enormous ſize ; particularly in the Iſland of Java, where, we are aſſured, that one of them will deſtroy and devour a buffalo. In a letter, printed in the German Ephemerides,

merides, we have an account of a combat between an enormous ſerpent and a buffalo, by a perſon, who aſſures us, that he ſaw it himſelf. The ſerpent had for ſome time been waiting near the brink of a pool, in expectation of its prey; when a buffalo was the firſt that offered. Having darted upon the affrighted animal, it inſtantly began to warp it round its voluminous twiſtings: and at every twiſt the bones of the buffalo were heard to crack almoſt as loud as the report of a cannon. It was in vain that the poor animal ſtruggled and bellowed. Its enormous enemy entwined it too cloſely to get free. At length, however, all its bones being maſhed to pieces, like thoſe of a malefactor on the wheel, and the whole body reduced to an uniform maſs, the ſerpent untwined its folds to ſwallow its prey at leiſure. To prepare for this, and to make the body ſlip down the throat more eaſily, it was ſeen to lick the whole body over, and thus cover it with its mucus. It then began to ſwallow it at that end that offered leaſt reſiſtance. Its length of body in the mean time was dilated to receive its prey, and thus took in at once a morſel that was thrice its own thickneſs. We are aſſured by travellers, that theſe animals are often found with the body of a ſtag in their gullet, while the horns, which they are unable to ſwallow ſtick out at their mouths.

But it is happy for mankind that the rapacity of theſe frightful creatures is often their puniſhment. Whenever, therefore, any of the ſerpent kind have gorged themſelves in this manner, whenever their body is ſeen particularly diſtended with food, they then become torpid, and may be approached and even deſtroyed without danger.

Other creatures have a choice in their proviſion; but the ſerpent indiſcriminately preys upon all; the buffalo, the tiger, and the gazelle. One would think that the porcupine's quills might be ſufficient to protect it; but whatever has life, ſerves to appeaſe the hunger of theſe devouring creatures. Porcupines, with all their quills, have frequently been found in their ſtomachs, when killed and opened; nay, they moſt frequently are ſeen to devour each other.

But though theſe animals are, above all others, the moſt voracious; and though the morſel which they ſwallow without chewing, is greater than what any other creature, either by land or water, the whale itſelf not excepted, can devour, yet no animal can be ſo abſtinent as they. A ſingle meal, with many of the ſnake kind, ſeems to be the adventure of a ſeaſon; and is an occurence for which they have been for weeks, ſometimes even for months, in expectation of. Their prey continues, for a long time, partly in the ſtomach, partly in the gullet; and a part is often ſeen hanging out of the mouth. In this manner it digeſts by degrees; and in proportion as the part below is diſſolved, the part above is taken in. It is not therefore till this tedious operation is entirely performed, that the ſerpent renews its appetite and its activity. But ſhould any accident prevent it from iſſuing once more from its cell, it ſtill can endure famine for weeks, months, nay, for years together. Vipers are often kept in boxes for ſix or eight months, without any food whatever; and there are little ſerpents ſometimes ſent over to Europe, from Grand Cairo, that live for ſeveral years in glaſſes, and never eat nor even ſtain the glaſs with their excrement. Thus the ſerpent tribe unite in themſelves two very oppoſite qualities; wonderful abſtinence, and yet incredible rapacity.

Though all ſerpents are amphibious, ſome are much fonder of the water than others; and though deſtitute of fins or gills, they remain at the bottom, or ſwim along the ſurface with great eaſe. They can, however, endure to live in freſh-water only; for ſalt is an effectual bane to the whole tribe.

Some ſerpents have a moſt horrible fœtor attending them, which is alone capable of intimidating the brave. This proceeds from two glands near the vent, like thoſe in the weaſel or the pole-cat; and, like thoſe animals, in proportion as they are excited by rage or by fear, the ſcent grows ſtronger. It would ſeem, however, that ſuch ſerpents as are moſt venomous, are leaſt offenſive in this particular; ſince the rattleſnake and the viper have no ſmell whatever. We are even told that at Calecut and Crangánor, in the Eaſt Indies, there are ſome very noxious ſerpents who are ſo far from being diſagreeable, that their excrements are ſought after and kept as the moſt pleaſing perfume. The Eſculapian ſerpent is alſo of this number.

Some ſerpents bring forth their young alive; as the viper: ſome bring forth eggs, which are hatched by the heat of their ſituation; as the common black ſnake, and the majority of the ſerpent tribe. When a reader, ignorant of anatomy, is told that ſome of thoſe animals produce their young alive, and that ſome produce eggs only, he is apt to ſuppoſe that there is a very great difference in the internal conformation, which makes ſuch a variety in the manner of bringing forth. But this is not the caſe. Theſe animals are internally alike, in whatever manner they produce their young; and the variety in their bringing forth, is rather a ſlight than a real diſcrimination. The only difference is, that the viper hatches her eggs, and brings them to maturity within her body. The ſnake is more premature in her productions, and ſends her eggs into the light, ſome time before the young ones are capable of leaving the ſhell. Thus, if either are opened, the eggs will be found in the womb, covered with their membranous ſhell, and adhering to each other, like large beads on a ſtring. In the eggs of both the young ones will be found, though at different ſtages of maturity. Thoſe of the viper will crawl and bite in the moment the ſhell that incloſes them is broken open; thoſe of the ſnake are not yet arrived at their perfect form.

Father Labat took a ſerpent of the viper kind, that was nine feet long, and ordered it to be opened in his preſence. He then ſaw the manner in which the eggs of theſe animals lie in the womb. In this creature there were ſix eggs, each of the ſize of a gooſe egg, but longer, more pointed, and covered with a membranous ſkin, by which alſo they were united to one another. Each of theſe eggs contained from thirteen to fifteen young ones, about ſix inches long, and as thick as a gooſe quill. Theſe little miſchievous animals were no ſooner let looſe from the ſhell, than they crept about, and put themſelves into a threatening poſture, coiling themſelves up and biting the ſtick with which he was deſtroying them. In this manner he killed ſeventy-four young ones. Thoſe however, that were contained in one of the eggs eſcaped at the place where the female was killed, by the burſting of the egg and their getting among the buſhes.

The laſt diſtinction that I ſhall mention, but the moſt material, among ſerpents is, that ſome are venomous and ſome inoffenſive, but not above a tenth of their number are actually venomous.

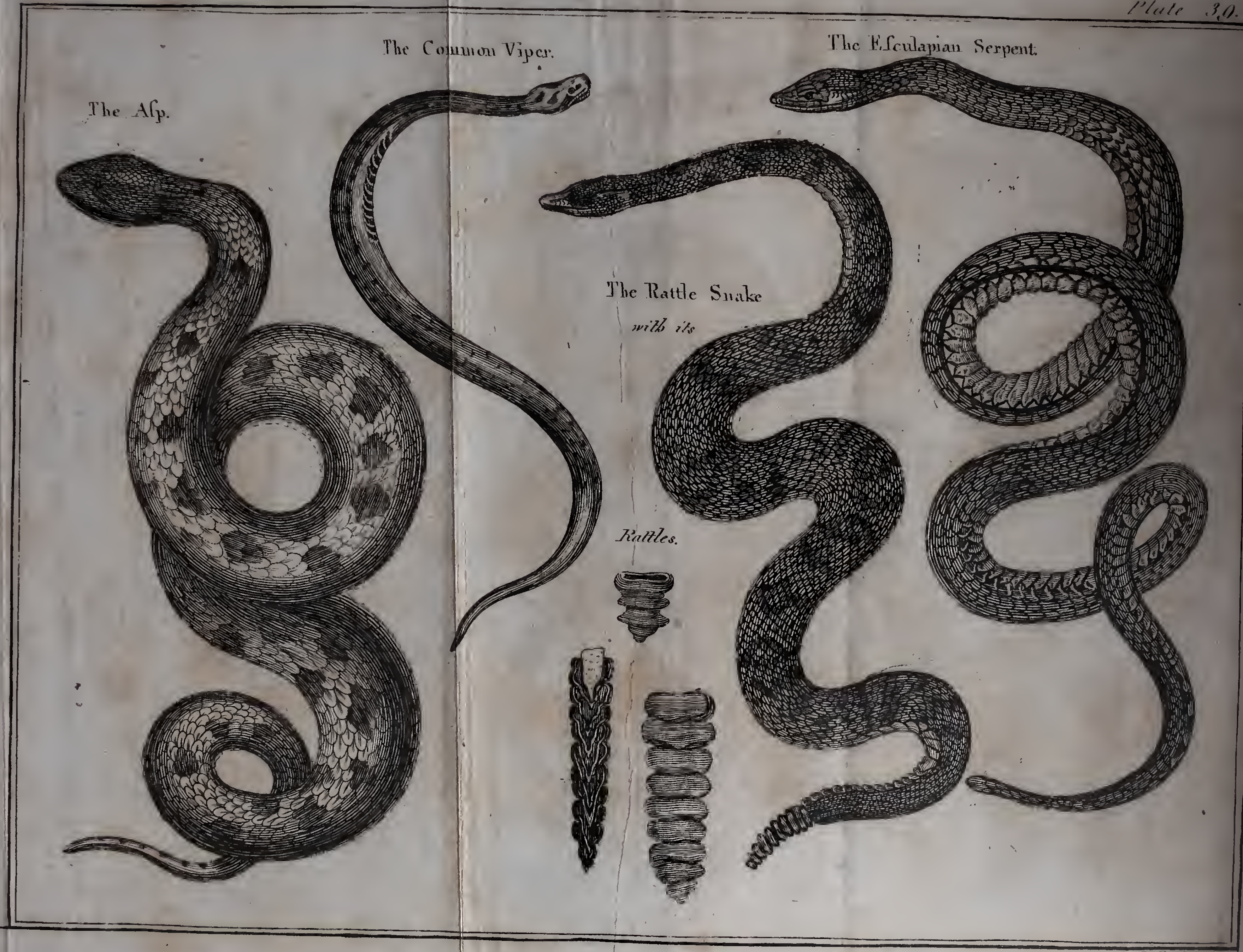
From theſe noxious qualities in the ſerpent kind, it is no wonder that not only man, but beaſts and birds, carry on an unremitting war againſt them. The ichneumon of the Indians, and the peccary of America, deſtroy them in great numbers. Theſe animals have the art of ſeizing them near the head; and it is ſaid that they can ſkin them with great dexterity. The vulture and the eagle alſo prey upon them in great abundance; and often ſouſing down from the clouds, drop upon a long ſerpent, which they ſnatch ſtruggling and writhing in the air. Dogs alſo are bred up to oppoſe them. Father Feuillee tells us, that being in the woods of Martinico, he was attacked by a large ſerpent, which he could not eaſily avoid, when his dog immediately came to his relief, and ſeized the aſſailant with great courage. The ſerpent entwined the dog, and preſſed him ſo violently, that the blood came out of his mouth, and yet the dog never ceaſed till he had torn it to pieces. The dog was not ſenſible of his wounds during the fight; but ſoon after his head ſwelled prodigiouſly, and he lay on the ground as dead. But his maſter having found, hard by, a banana tree, he applied its juice, mixed with treacle, to the wounds; which recovered the dog, and quickly healed his ſores.

In India there is nothing ſo common as dancing ſerpents, which are carried about in a broad flat veſſel ſomewhat like a ſieve. Theſe erect and put themſelves in motion at the word of command. When their keeper ſings a ſlow tune, they ſeem by their heads to keep time; when he ſings a quicker meaſure, they appear to move more lively. All animals have a certain degree of docility; and we find that ſerpents themſelves can be brought to move and approach at the voice of their maſter. From this trick ſucceſsfully practiſed before the ignorant, it is moſt probable has ariſen all the boaſted pretenſions which ſome have made to charming ſerpents; an art to which the native Americans pretend at this very day.

Of Venomous Serpents.

In all countries, the poiſon of the ſerpent is ſufficiently formidable to deſerve notice, and to excite our attention to its nature and effects. It will therefore in the firſt place be proper to deſcribe its ſeat in the animal, alſo the inſtrument by which the wound is made and the poiſon injected. In all this venomous claſs of reptiles, whether the viper the rattle-ſnake, or the cobra di capello, there are two large teeth or fangs that iſſue from the upper jaw, and that hang out beyond the lower. The reſt of the ſnake tribe are deſtitute of theſe; and it is moſt probable that wherever theſe fangs are wanting, the animal is harmleſs. On the contrary, wherever they are found it is to be avoided as the moſt peſtilent enemy. Our firſt great attention, therefore, upon ſeeing a ſerpent ſhould be directed to the teeth. The black ſnake, the liboya, the blind worm, and a hundred others that might be mentioned, have their teeth of an equal ſize, fixed into the jaws, and with no other apparatus for inflicting a dangerous wound than a dog or a lizard. But it is otherwiſe with the venomous tribe we are now deſcribing. Theſe are well furniſhed, not only with an elaboratory, where the poiſon is formed, but a canal by which it is conducted to the jaw,

Plate 30.


The Common Viper.
The Eſculapian Serpent.
The Aſp.
The Rattle Snake
with its
Rattles.

J. Fraser sc.

a bag under the tooth for keeping it ready for every occaſion, and alſo an aperture in the tooth itſelf for injecting it into the wound. The venom contained in this bag is a yellowiſh, thick, taſteleſs liquor, which injected into the blood is death, yet which may be ſwallowed without any danger.

The fangs that give the wound are large in proportion to the ſize of the animal that bears them; crooked, yet ſharp enough to inflict a ready wound. They grow one on each ſide, and ſometimes two from two moveable bones in the upper jaw, which by ſliding backward or forward, have a power of erecting or depreſſing the teeth at pleaſure. In theſe bones are alſo fixed ſeveral teeth which are by no means venomous, and which only ſerve to take and hold the animal's prey. If a viper inflict the wound, and the remedy be neglected, the ſymptoms are not without danger. It firſt occaſions an acute pain in the place affected, attended with a ſwelling, firſt red, and afterwards livid. To this ſucceed great ſickneſs at the ſtomach, bilious and convulſive vomitings, cold ſweats, pains about the navel, and death itſelf. Theſe ſymptoms are much more violent, and ſucceed each other more rapidly after the bite of a rattle-ſnake; but when the perſon is bit by the cobra di capello, he dies in an hour, his whole frame being diſſolved into a putrid maſs of corruption.

In the eaſtern and weſtern Indies, the number of noxious ſerpents is various. In Great Britain, the viper is the only animal from whoſe bite we have any thing to fear. In the tropical climates, the rattle-ſnake, the whip-ſnake, and the cobra di capello, are the moſt formidable, though by no means the moſt common.

Of Vipers.

Vipers are found in many parts of Europe; but the dry, ſtony, and in particular the chalky countries abound with them. This animal ſeldom grows above two feet long; though ſometimes they are found above three. The ground colour of their bodies is a dirty yellow; that of the female is deeper. The back is marked the whole length with a ſeries of rhomboid black ſpots, touching each other at the points; the ſides with triangular ones, and the belly is entirely black. It is chiefly diſtinguiſhed from the common black ſnake by the colour, which in the latter is more beautifully mottled, as well as by the head, which is thicker than the body; but particularly by the tail, which in the viper, though it ends in a point, does not run tapering to ſo great a length as in the other. When, therefore, other diſtinctions fail, the difference of the tail can be diſcerned at a ſingle glance.

The viper differs from moſt other ſerpents in being much ſlower, as alſo in excluding its young completely formed, and bringing them forth alive. The kindneſs of Providence ſeems exerted not only in diminiſhing the ſpeed, but alſo the fertility, of this dangerous creature. They copulate in May, and are ſuppoſed to be about three months before they bring forth, and have ſeldom above eleven eggs at a time. Theſe are thoſe of the ſize of a blackbird, and chained together in the womb like a ſtring of beads. Each egg contains from one to four young ones; ſo that the whole of a brood may amount to about twenty or thirty. They continue in the womb till they come to ſuch perfection as to be able to burſt from the ſhell; and they are ſaid by their own efforts to creep from their confinement in the open air, where they continue for ſeveral days without taking any food whatſoever.

The viper is capable of being very abſtinent. Some have been kept in a box ſix months without food; yet during the whole time they did not abate of their vivacity. They feed only a ſmall part of the year, but never during their confinement; for if mice, their favourite food, ſhould at that time be thrown into their box, though they will kill, yet they will never eat them. When at liberty, they remain torpid throughout the winter; yet, when confined, they have never been obſerved to take their annual repoſe.

They are uſually taken with wooden tongs, by the end of the tail, which may be done without danger; for, while in that poſition, they are unable to wind themſelves up to hurt their enemy. Notwithſtanding this precaution, the viper-catchers are frequently bitten by them; but, by the application of olive-oil, the bite is effectually cured.

The Rattle-Snake.

The rattle-ſnake is bred in America, and in no part of the old world. Some are as thick as a man's leg, and ſix feet in length; but the moſt uſual ſize is from four to five feet long. In moſt particulars it reſembles the viper. It differs, however, in having a large ſcale, which hangs like a penthouſe over each eye. They are of an orange tawny, and blackiſh colour on the back: and of an aſh-colour on the belly inclining to lead. The male may be diſtinguiſhed from the female, by a black velvet ſpot on the head, and by the head being ſmaller and longer. But that which in addition to their ſuperior malignity, diſtinguiſhes them from all other animals, is their rattle, an inſtrument lodged in their tail, by which they make ſuch a loud, rattling noiſe, when they move, that their approach may be perceived, and the danger avoided. This rattle, which is placed in the tail, when taken out of the body, is not unlike the curb chain of a bridle. It is compoſed of ſeveral thin, hard, hollow bones, linked to each other, and rattling upon the ſlighteſt motion. It is ſuppoſed by ſome, that the ſnake acquires an additional bone every year; and that, from this, its age may be preciſely aſcertained. However this may be, certain it is, that the young ſnakes, of a year or two old, have no rattles at all; while many old ones have been killed, that had from eleven to thirteen joints each. They ſhake and make a noiſe with theſe rattles with prodigious quickneſs when they are diſturbed; yet, the peccary and the vulture are no way terrified at the ſound, but haſten, at the ſignal, to ſeize the ſnake, as their moſt favourite prey.

It is very different with almoſt every other animal. The certain death which enſues from this terrible creature's bite, makes a ſolitude wherever it is heard. It moves along with the moſt majeſtic rapidity; neither ſeeking to offend the larger animals, nor fearing their inſults. If unprovoked, it never meddles with any thing but its natural prey; but when accidentally trode upon, or purſued to be deſtroyed, it then makes a deſperate defence. It erects itſelf upon its tail, throws back the head, and inflicts its wound in a moment; then parts, and inflicts a ſecond wound. After this, it is ſaid, by ſome, to remain torpid and inactive, without even attempting to eſcape.

The very inſtant the wound is inflicted, though ſmall in itſelf, it appears more painful than the ſting of a bee. This pain, which is ſo ſuddenly felt, far from abating, grows every moment more excruciating and dangerous. The limb ſwells: the venom reaches the head, which is ſoon of a monſtrous ſize: the eyes are red and fiery: the heart beats quick, with frequent interruptions. In ſhort, the pain becomes intolerable, and ſome expire under it in five or ſix hours; but others, who are of ſtronger conſtitutions, ſurvive the agony for a few hours longer, only to ſink under a general mortification which enſues, and corrupts the whole body.

The Whip-ſnake.

The ſerpent called the whip-ſnake, is ſtill more venomous than the former. This animal, which is a native of the Eaſt, is about five feet long, yet not much thicker than the thong of a coachman's whip. It is exceedingly venomous; and its bite is ſaid to kill in about ſix hours. One of the Jeſuit miſſionaries, happening to enter into an Indian pagoda, ſaw what he took to be a whip cord lying on the floor, and ſtooped to take it up; but upon handling it, what was his ſurpriſe to find that it was animated, and no other than the whip-ſnake, of which he had heard ſuch formidable accounts. Fortune, however, ſeemed favourable to him; for he graſped it by the head, ſo that it had no power to bite him, and only twiſted its folds up his arm. In this manner he held it, till it was killed by thoſe who came to his aſſiſtance.

To this formidable claſs might be added the Asp, whoſe bite, however, is not attended with thoſe drowſy ſymptoms which the ancients aſcribed to it. The Jaculus of Jamaica alſo, is one of the ſwifteſt of the ſerpent kind. The Hæmorrhois, ſo called from the hæmorrhages which its bite is ſaid to produce. The Seps, whoſe wound is very venomous, and occaſions the part affected to corrupt in a very ſhort time: the Coral Serpent, which is red, and whoſe bite is ſaid to be fatal. But the Corbra di Capella, or Hooded Serpent, inflicts the moſt deadly and incurable wounds. Of this formidable creature there are five or ſix different kinds; but they are all equally dangerous, and their bite is followed by a ſpeedy death. It is from three to eight feet long, with two large fangs hanging out of the upper jaw. It has a broad neck, and a mark of dark brown on the forehead; which, when viewed front-wiſe, looks like a pair of ſpectacles; but behind, like the head of a cat. The eyes are fierce, and full of fire; the head is ſmall, and the noſe flat, though covered with very large ſcales, of a yellowiſh aſh-colour. Its ſkin is white; and the large tumour on the neck is flat, and covered with oblong, ſmooth ſcales.

Of Serpents without Venom.

This claſs of ſerpents all want that artificial mechaniſm by which the poiſonous tribe inflict ſuch deadly wounds. They have no gland in the head for preparing venom; no conduits for conveying it to the teeth; no receptacles there; no hollow in the inſtrument that inflicts the wound. Their bite, when the teeth happen to be large enough to penetrate the ſkin, for in general they are too ſmall for this purpoſe, is attended with no other ſymptoms than thoſe of an ordinary puncture. Beſides many of this tribe, as if ſenſible of their own impotence, cannot be provoked to bite, though ever ſo rudely aſſaulted. They hiſs, dart out their forky tongues, erect themſelves on the tail, and call up all their terrors to intimidate their aggreſſors, but ſeem to conſider their teeth as unneceſſary inſtruments of defence, and never attempt to uſe them. Even among the largeſt of this kind, the teeth are never employed, in the moſt deſperate engagements. When a hare or a bird is caught, the teeth may ſerve to prevent ſuch ſmall game from eſcaping. When, on the contrary, a buffalo or a tiger is to be encountered, it is by the ſtrong folds of the body, by the fierce verberations of the tail, that the enemy is deſtroyed. By this twining round, and drawing the knot with convulſive energy, this enormous reptile breaks every bone in the quadruped's body, and then, at one morſel, devours its prey.

Hence we may diſtinguiſh the unvenomous tribe into two kinds: firſt, into thoſe which are ſeldom found of any conſiderable ſize, and that never offend animals larger or more powerful than themſelves, but which find their chief protection in flight, or in the doubtfulneſs of their form; ſecondly, into ſuch as grow to an enormous ſize, fear no enemy, but indiſcriminately attack all other animals, and devour them. Of the firſt kind is the Common Black Snake, the Blind Worm, the Eſculapian Serpent, the Amphiſbæna, and ſeveral others. Of the ſecond, the Liboya, the Boiguacu, the Depona, and the Boiquatrara.

The Black Snake.

The Black Snake is the largeſt of Engliſh ſerpents, and is ſometimes above four feet long. The neck is ſlender: the middle of the body, is thick: the back and ſides, are covered with ſmall ſcales; the belly, with oblong, narrow, tranſverſe plates; the colour of the back and ſides is of a duſky brown: the middle of the back is marked with two rows of ſmall black ſpots, running from the head to the tail: the plates on the belly are duſky: the ſcales on the ſides are of a bluiſh white: the teeth are ſmall and ſerrated, lying on each ſide of the jaw, in two rows. The whole ſpecies is perfectly inoffenſive, taking ſhelter in dunghills, and among buſhes in moiſt places; whence they ſeldom remove, unleſs in the midſt of the day, in ſummer, when they are invited by the heat, to baſk themſelves in the ſun.

The black ſnake preys upon frogs, inſects, worms, mice, and young birds; and, conſidering the ſmallneſs of the neck, it is amazing how large an animal it will ſwallow. The black ſnake of Virginia, which is larger than ours, and generally grows to ſix feet long, takes a prey proportionable to its ſize; partridges, chickens, and young ducks. It is generally found in the neighbourhood of the hen-rooſt, and will devour the eggs, even while the hen is ſitting upon them. Theſe it ſwallows whole; and often, after it has done the miſchief, will coil itſelf round in the neſt.

The whole of this tribe are oviparous, laying eighty or an hundred eggs at a time, in dung hills or hot-beds; the heat of which, aided by that of the ſun, brings them to maturity. During winter, they lie torpid, in banks of hedges, and under old trees.

The Blind Worm.

The Blind Worm is another harmleſs reptile, with a formidable appearance. The uſual length of this ſpecies is eleven inches. The eyes are red, the head ſmall, the neck ſtill more ſlender. From the neck the body grows ſuddenly, and continues of an equal bulk to the tail, which ends quite blunt. The colour of the back is cinereous, marked with very ſmall lines, compoſed of minute black ſpekcs. The motion of this ſerpent is ſlow; from which, and from the ſmallneſs of the eyes, are derived its names; ſome calling it the ſlow, and ſome the Blind Worm. Like all the reſt of the kind, in our climates, they lie torpid during winter, and are ſometimes found, in vaſt numbers, twiſted together. This animal, like the former, is perfectly innocent; like the viper, however, it brings forth its young alive.

The Amphiſbæna.

The Amphiſbæna, or the Double-headed Serpent, is remarkable for moving along with either the head or the tail foremoſt: whence it has been thought to have two heads. Some have affirmed that its bite is dangerous; but this muſt be a miſtake, as it wants the fangs, and conſequently the elaboratory that prepares the poiſon.

The Eſculapian Serpent.

The Eſculapian Serpent of Italy is among this number. In that country, it is ſuffered to crawl about the chambers, and often gets into the beds where people lie. It is a yellow ſerpent, of about an ell long; and, though innocent, yet will bite when exaſperated. They are ſaid to be great deſtroyers of mice; and this may be the reaſon why they are taken under human protection. The Boyuna of Ceylon is equally a favourite among the natives; and they conſider the meeting it as a ſign of good luck. The Surinam Serpent, which ſome improperly call the Ammodytes, is equally harmleſs and deſireable among the ſavages of that part of the world. They conſider themſelves as extremely happy, if this animal come into their huts. The colours of this ſerpent are ſo many and beautiful, that they exceed deſcription; and theſe, perhaps, are the chief inducements to the ſavages, to conſider its viſits as ſo very fortunate. A ſtill greater favourite is the Prince of Serpents, a native of Japan, matchleſs for beauty. The ſcales which cover the back are reddiſh, finely ſhaded, and marbled with large ſpots of irregular figures mixed with black. The fore part of the head is covered with large, beautiful ſcales: the jaws are bordered with yellow: the forehead is marked with a black marbled ſtreak, and the eyes are handſome and lively. But the Gerenda of the Eaſt Indies is the moſt eſteemed. To this animal, which is finely ſpotted with various colours, the natives of Calicut pay divine honours; and while their diety lies coiled up, which is its uſual poſture, the people proſtrate themſelves before it, with ſtupid adoration. The African Gerenda is larger, and worſhipped in the ſame manner, by the inhabitants of the coaſts of Mozambique.

But, in the larger tribe of ſerpents, there is nothing but danger to be apprehended. This formidable claſs, though without venom, have ſomething frightful in their colour, as well as in their ſize and form. They want that vivid hue with which the ſavages are ſo much pleaſed in the leſſer kinds. They are all of a duſky colour, with large teeth, which are more formidable than dangerous.

The firſt of this claſs, is the Great Jiboya of Java and Brazil, which Leguat affirms, to be fifty feet long. The largeſt animal of this kind, which has been brought into Europe, is but thirty-ſix feet long; and it is probable, that much greater have been ſeen and deſtroyed, before they were thought worth ſending ſo far, to ſatisfy European curioſity. The moſt uſual length, however, of the jiboya, is about twenty feet, and it is thick in proportion. The teeth are ſmall in proportion to the body; nor are they uſed, but when it ſeizes the ſmalleſt prey.

The Boiguacu.

The Boiguacu is ſuppoſed to be the next in ſize, and has often been ſeen to ſwallow a goat. It is thickeſt in the middle of the body, and grows ſhorter and ſmaller towards the head and the tail. It has a double row of ſharp teeth in each jaw, ſhining like mother-of-pearl. The head is broad, and over the eyes it is raiſed into two prominences. Near the extremity of the tail there are two claws, reſembling thoſe of birds.

Theſe ſerpents lie hid in thickets, whence they ſally out unawares, and raiſing themſelves upright on their tails, will attack both men and beaſts. They make a loud hiſſing noiſe when exaſperated; and ſometimes winding up trees, they will dart down upon travellers, and twiſt themſelves ſo cloſely round their bodies, as to diſpatch them in a very few minutes.

To this claſs of large ſerpents, we may refer the Depona, a native of Mexico, with a very large head, and great jaws. The mouth is armed with cutting, crooked teeth, among which there are two longer than the reſt, placed in the fore part of the upper jaw, but very different from the fangs of the viper. All round the mouth there is a broad ſcaly border; and the eyes are ſo large, that they give it a very terrible aſpect. The forehead is covered with very large ſcales, on which are placed others, that are ſmaller, curiouſly ranged. Thoſe on the back are greyiſh. Each ſide of the belly is marbled with large ſquare ſpots, of a cheſnut colour; in the middle of which is a ſpot, which is round and yellow. They avoid the ſight of man; and conſequently, never do much harm.

CHAP. XXXV.

OF INSECTS IN GENERAL—OBSERVATIONS ON THE BEE, THE ANT, AND THE SILK-WORM—THE INFERIORITY AND IMPERFECTION OF THIS CLASS OF ANIMALS—THEIR INSTINCTS—USES—NATURE—CLASSIFICATION—INSECTS WITHOUT WINGS—GRASSHOPPERS,—&C.—MOTHS AND BUTTERFLIES—OTHER FLIES—ZOOPHYTES.

MANY concurring circumſtances hinder us from exhibiting a complete hiſtory of inſects.—Their numbers infinitely exceed that of all the other claſſes of animals. Remote from our habits, and in general, by their minuteneſs placed beyond the ſcope of our obſervation, too much of what naturaliſts have produced upon theſe ſubjects, is liable, at leaſt, to ſuſpicion. We can contemplate, for inſtance, with admiration, the wonderful fabric of the bee, or the induſtry of the ant; but when we would penetrate into the *realm* of the one, or the *republic* of the other, we neceſſarily ſubject ourſelves to much deception, and the imagination is called in to ſupply the place of obſervation. Of the ſilk-worm itſelf we can only relate, that it proceeds from the egg a naked caterpillar; it ſpins its curious thread, becomes a chryſalis, and ends its exiſtence as a winged animal. All, therefore, that appears neceſſary in this department, is, a general account of the nature of the inſect world in general, and to draw the line of diſtinction between them and the other claſſes of animated beings.

There is, indeed, another reaſon why the attention ſhould not be too much diverted into this minute channel; and that is, its want of importance. For, however the admirers of butterflies and caterpillars may chuſe to magnify their favourite purſuit, it cannot be doubted, that the inſect tribe are of a nature extremely inferior to all the other inhabitants of the earth.

Of all living beings, man offers the moſt wonderful variety in his internal conformation. Quadrupeds come next; and other animals follow in proportion to their powers or their excellencies. Inſects ſeem above all others the moſt imperfectly formed. From their minuteneſs, they even baffle the diſſecting knife itſelf; but what argues an evident imperfection, is, that many of them can live a long time, though deprived of thoſe organs which are neceſſary to life in the higher ranks of nature. Many of them are furniſhed with lungs and a heart like nobler animals; yet the caterpillar continues to live, though its heart and lungs, which is often the caſe, are entirely eaten away.

But it is not from their conformation alone, that inſects are inferior to other animals, but from their inſtincts alſo. It is true, that the ant and the bee preſent us with very ſtriking inſtances of aſſiduity; but, how far are their's beneath the marks of ſagacity exhibited in the hound or the ſtag! A bee taken from the ſwarm is totally helpleſs and inactive, incapable of giving the ſmalleſt variation to its inſtincts; it has but one method of operating; and, if put from that, it can turn to no other. In the purſuits of the hound, there is ſomething like a choice; in the labours of the bee, the whole appears like neceſſity or compulſion.

If inſects be conſidered as bearing a relation to man, and as aſſiſting him in the pleaſures or neceſſities of life, they will, even in this reſpect, ſink in the compariſon with the larger tribes of nature. It is true, that the bee, the ſilk-worm, the cochineal fly, and the cantharides, render him ſignal ſervices; but how many others of this claſs, are either noxious, or totally uſeleſs to him. Even in a country like ours, where all the noxious animals have been reduced by repeated aſſiduity, the inſect tribe ſtill maintain their ground, and are but too often unwelcome intruders upon the fruits of human induſtry. But, in more uncultivated regions, their annoyance and devaſtations are terrible. What an uncomfortable life muſt the natives lead in Lapland, and ſome parts of America, where, if a candle be lighted, the inſects ſwarm in ſuch abundance, as inſtantly to extinguiſh it with their numbers; where the inhabitants are obliged to ſmear their bodies and faces with tar, or ſome other compoſition, to protect them from the puncture of other minute enemies; where, though millions are deſtroyed, famiſhed millions are ſtill ſeen to ſucceed, and to make the torture endleſs!

Their amazing number is alſo an argument of their imperfection. It is a rule that obtains through all nature, that the nobler animals are ſlowly produced, and that nature acts with a kind of dignified œconomy. The meaner births are laviſhed in profuſion; and thouſands are brought forth merely to ſupply the neceſſities of the more favourite objects of creation. Of all productions in nature, inſects are the moſt numerous. Vegetables that cover the ſurface of the earth, bear no proportion

portion to their multitudes; and though, at firſt ſight, herbs of the field ſeem to be the parts of organized nature produced in the greateſt abundance, yet, upon minuter inſpection, we ſhall find every plant ſupporting a number of ſcarce perceptible creatures, that fill up the various ſtages of youth, vigour and age, in the compaſs of a few days' exiſtence.

All other animals are capable of ſome degree of education. Their inſtincts may be ſuppreſſed or altered. The dog may be taught to fetch and carry; the bird to whiſtle a tune, and the ſerpent to dance; but the inſect has but one invariable method of operating. No arts can turn it from its inſtincts; and indeed its life is too ſhort for inſtruction, as a ſingle ſeaſon often terminates its exiſtence.

For theſe reaſons, the inſect tribe are deſervedly placed in the loweſt rank of animated nature; and, in general, they ſeem to be more allied to the vegetables on which they feed, than to the nobler claſſes above them. Many of them are attached to one vegetable, often to a ſingle leaf. There they increaſe with the flouriſhing plant, and die as it decays. A few days fill up the meaſure of their contemptible lives; while the ends for which they were produced, or the pleaſures they enjoyed, to us at leaſt, are utterly unknown.

Yet, while we are thus fixing the rank of a certain claſs of animals, it ſeems neceſſary to define the nature of thoſe which are thus degraded. Definitions, in general, produce little knowledge; but here, where the ſhades of nature are ſo intimately blended, ſome diſcrimination is neceſſary to prevent confuſion. The ſmallneſs of the animal, for inſtance, does not conſtitute an inſect. Otherwiſe many of the lizard kind, which are not above two inches long, would come under this denomination; and if the ſmaller lizards, why not the crocodile, which would be a terrible inſect indeed? In the ſame manner, ſmallneſs, with a ſlow, creeping motion, does not conſtitute an inſect; for, though ſnails might be called inſects with ſome propriety, the whole tribe of ſea ſhell-fiſh would then have equal pretenſions, and a very troubleſome innovation would be brought into our language, which is already formed. Excluding ſuch animals, therefore, from the inſect tribe, we may define inſects to be *little animals without red blood, bones or cartilages, furniſhed with a trunk, or elſe a mouth, opening lengthwiſe, with eyes which they are incapable of covering, and with lungs which have their openings on the ſides.* This definition comprehends the whole claſs of inſects, whether with or without wings, whether in their caterpillar or butterfly ſtate, whether produced in the ordinary method of generation between male and female, or from an animal that is itſelf both male and female, or from the ſame animal cut into ſeveral parts, and each part producing a perfect animal.

Hence it appears, that in this claſs of animals there are numerous diſtinctions. Almoſt every ſpecies has its own diſtinct hiſtory, and exhibits manners, appetites, and modes of propagation peculiar to itſelf.

In the larger ranks of exiſtence, two animals that nearly reſemble each other in form, will be found to have a ſimilar hiſtory; but here, inſects almoſt entirely alike, will be often found perfectly different, as well in their manner of bringing forth and ſubſiſting, as in the changes which they undergo during their ſhort lives.

Upon taking a ſlight view of the whole inſect tribe, juſt when they are ſuppoſed to rouze from their ſtate of annual torpidity, when they begin to feel the genial influence of ſpring, and again exhibit new life in every part of nature, their numbers and their varieties ſeem to exceed all calculation; and they are indeed too great for deſcription. When we look cloſer, however, we ſhall find ſome ſtriking ſimilitudes, either in their propagation, their manners, or their form, that give us a hint for grouping ſeveral of them into one deſcription, and thus enabling us to avoid the labour of a ſeparate hiſtory for every ſpecies.

In a curſory inſpection of the inſect tribe, the firſt animals that offer themſelves are thoſe which want wings, that appear crawling about on ever plant, and on every ſpot of earth which we regard with any degree of attention. Of theſe, ſome never obtain wings at any period of their exiſtence, but are deſtined to creep on the vegetable, or the ſpot of earth where they are ſtationed, for their whole lives. On the contrary, others are only candidates for a more happy ſituation, and only wait their growing wings, when they may be ſaid to arrive at their ſtate of full perfection.

Thoſe that never have wings, but creep about till they die, may be conſidered as conſtituting the *firſt* claſs of inſects. All theſe, the flea and the wood-louſe only excepted, are produced from an egg; and, when once they break the ſhell, they never undergo any further change of form but continue to grow larger till they die. Thus the louſe or the ſpider are produced from an egg, never ſuffering any alteration when once they are excluded; but, like the chicken or the duck, remaining invariably the ſame, from their birth to their diſſolution. The ſtrength of ſome of this claſs is almoſt incredible. A flea will draw a chain a hundred times heavier than itſelf, and will eat ten times its own ſize of proviſion in a day.

The ſecond order of inſects conſiſts of ſuch as have wings; but which, when produced from the egg, have thoſe wings caſed up in ſuch a manner as not to appear. This circumſtance, however, does not prevent the animal's running, leaping, and moving with its natural celerity; but, when the caſe burſts, and the wings have a power of expanding, all its motions become more extenſive, and it arrives at full perfection. Thus the graſshopper, the dragon fly, and the earwig, have their wings at firſt bound down; but when the ſkin, that, like a pair of ſtays, kept them confined, burſts, they are then expanded, and the animal purſues the purpoſes for which it was deſtined. There is one animal of this claſs, called the Ephemera, which lives in this ſtate but a ſingle day.

The third order of inſects is of the moth and butterfly kind. Theſe all have four wings, each covered with a mealy ſubſtance of various colours, which, when handled, comes off upon the fingers; and, if examined by the microſcope, will appear like feathers, with which the wing is nicely embroidered all over. Theſe inſects alſo are produced in a manner peculiar to themſelves. They are firſt hatched from an egg, whence proceeds a caterpillar, that eats, and often caſts its ſkin. This caterpiller having diveſted itſelf for the laſt time, aſſumes a new covering, which is called a chryſalis, or the cone in the ſilk-worm, in which it conceals itſelf till it comes forth a perfect moth and butterfly.

The fourth order is of thoſe winged inſects which come from a worm, inſtead of a caterpillar, and yet undergo changes ſimilar to thoſe which moths and butterflies do. They are firſt excluded from the egg as a worm, and then become a chryſalis. In ſome, their wings and legs are ſeen; in others, the animal is quite detached from the cone in which it is concealed; but all, at length, break their priſon, and come out perfect winged animals; ſome furniſhed with two wings, and ſome with four. The wings of all theſe differ from thoſe of the butterfly and moth kind, by not having the mealy matter which is ever found on the wings of the former. In this claſs we may place the numerous tribes of gnats, beetles, bees and flies.

To theſe we add, as a fifth order, a numerous tribe lately diſcovered, to which naturaliſts have given the name of Zoophytes. Theſe do not go through the ordinary forms of generation, but may be propagated by diſſection. Some of them though cut into an hundred parts, ſtill retain life in each, and are endued with ſuch a vivacious principle, that every part will, in a ſhort time, become a perfect animal. They ſeem a ſet of creatures placed between animals and vegetables, and make the ſhade that connects animated and inſenſible nature. To this claſs belong the polypus, the earth-worm, all the varieties of the ſea nettle. To this alſo may probably be referred thoſe curious creatures which produce the coral, the ſponge, and other ſingular and ſimilar marine productions.

It is impoſſible to finiſh our ſhort review of nature without obſerving the wonderful harmony and connection that ſubſiſts between all the different branches; without obſerving how happily one part ſupports another, and how every thing contributes to the general good. How infinitely great muſt that Eternal Mind be who framed all with ſuch amazing ſkill—Who ſees with a ſingle glance the operation and mechaniſm of the whole, from the minute anatomy of the ant, to thoſe innumerable worlds, thoſe vaſt and ſplendid orbs that gild the unbounded expanſe of the univerſe!

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